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DISEASES CAUSED BY BACTERIA AND FUNGI

HUSSEMANN, D. L., & TANNER, F. W. (1947.) **Relation of certain cooking procedures to staphylococcus food poisoning.**—*Amer. J. publ. Hlth.* **37.** 1407–1414. [Authors' summary and conclusions copied *verbatim.*] **389**

Using the multiple tube method, an attempt was made to establish thermal death time-temperature relationships for staphylococci in cream filling and to correlate such findings with the range and duration of temperatures attained in accepted cooking procedures for cream filling. One strain of *Staphylococcus aureus* was used as the test organism. Thermal death time determinations for the same organisms were also made at a range of temperatures, using a pH 7 phosphate buffer solution for the suspending medium.

In the range of temperatures studied, *Staphylococcus aureus* Strain C12069 (Dolman) was found apparently to survive for 30 minutes at 55° C. and to be destroyed in less than 8 minutes of heating at 85°C. In phosphate buffer solution, pH 7, the organism survived somewhat less stringent heat treatment. It appeared that at the conclusion of such a cooking procedure, cream filling was free from viable staphylococcus.

MILLER, A. A. (1948.) **An outbreak of staphylococcal food poisoning probably due to tinned sausage.**—*Mon. Bull. Min. Hlth publ. Hlth Lab. Serv.* **7.** 178–180. **390**

Visitors to a country hotel who had eaten a meal consisting of guinea-fowl, gravy and Viennese sausage became ill with vomiting and diarrhoea. In the faeces of two patients out of seven examined, a coagulase-positive type of *Staphylococcus aureus* was found. A staphylococcus organism of the same phage-type was isolated from the unconsumed remains of the suspected food. The Viennese sausage was thought to be the most likely source. Although two sausage tins of the same batch were bacteriologically negative, a third tin from a different batch, but supplied by the same dealer, yielded growth of *Staph. aureus* of the same phage-type.—A. MAYR-HARTING.

RICHOU, R. (1944.) L'anatoxitherapie staphylococcique en médicine vétérinaire. **[The use of staphylococcal anatoxin in veterinary medicine.]**—*Encyclopéd. vét. périod.* **1.** 26–29. **391**

A general account of the subject. Dosages for different animals are given.—A. FOGGIE.

BRUNER, D. W., EDWARDS, P. R., DOLL, E. R., & MORAN, A. B. (1948.) **A motile *Streptococcus* from an aborted equine fetus.**—*Cornell Vet.* **38.** 313–315. **392**

A streptococcus, serologically and biochemically belonging to Lancefield's Group D, was isolated from an aborted equine foetus. It was slightly motile and individual cells were observed to be monotrichous.—MARCUS S. BROOKE.

BUXTON, J. C. (1948.) **Bovine mastitis associated with group C haemolytic streptococci (animal pyogenes). [Correspondence.]**—*Vet. Rec.* **60.** 215–216. **393**

B. reports two outbreaks of mastitis in separate herds, from which group C streptococci were isolated. Fourteen cows collectively in the two herds were involved. The importance of the finding of this organism lies in its comparative resistance to intramammary infusion with penicillin.—R. M. LOOSMORE.

BUCH, H. (1946.) Scarlatana-Maelkeepidemien i Glostrup Marts 1945. **[The scarlatina milk epidemic in Glostrup in March 1945.]**—*Ugeskr. Laeg.* **108.** 991–996. [Abst. in *Bull. Hyg., Lond.* **21.** 793–794. (1946), copied *verbatim.* Signed CLAUDE LILLINGSTONE.] **394**

Hitherto all the milk-borne scarlatina epidemics recorded in Denmark have been traced to raw milk. In the present instance the milk in question was supposed to have been pasteurized, but the exact conditions under which pasteurization had been carried out remained somewhat obscure, the proprietor of the incriminated dairy being "very uninterested in contributing to the elucidation of the epidemic." In the course of a single day (March 16, 1945) 29 patients were taken to hospital. Next day 69 were admitted; on the third day, 55; and on the two following days, 37 and 4 respectively. It will thus be seen that the epidemic developed very rapidly. Altogether, 207 patients were admitted to hospital. Group A,

type I haemolytic streptococci were found in the patients, but bacteriological examinations of the staff of the dairy, of material from the farms supplying the milk, and of the milk itself from every herd, failed to give any clue to the origin of the outbreak. The first case began on March 14, and it was clear that the milk must have been infected on the previous day. It was also evident that the outbreak could not have been due to contamination of the milk after it had been presumed to have been pasteurized. The incubation period ranged from less than 24 hours to four days. The brevity of the outbreak could probably be traced to the milk having been infected on one day only. Among contact infections, seven involved six hospital nurses and a doctor. The complications included 23 cases of sinusitis. Otitis media occurred in about 9 per cent., and in the three cases of otitis media examined bacteriologically, haemolytic streptococci group A, type I were found. The total number of days in hospital for all the patients was 5,969, and the cost of hospital treatment alone was about kr. 100,000.

MOORE, B. (1948.) **A food-poisoning outbreak apparently caused by α-haemolytic streptococci.** —*Mon. Bull. Min. Hlth publ. Hlth Lab. Serv.* **7.** 136–145. **395**

An outbreak of food poisoning affecting the children in several schools is described. The incriminated dish was a chocolate pudding supplied to all schools from a central depot. The pudding had been prepared the previous day and the portions destined for the large schools had been kept warm overnight and during the next morning in large insulated containers. Those for some small schools had been distributed into small shallow dishes that permitted rapid cooling, and no case of food poisoning was reported from any of the smaller schools. From a sample of the pudding, α-haemolytic streptococci were isolated; some Gram-positive bacilli seen in addition to streptococci in the direct smear did not grow. The extract of the streptococcus produced symptoms in a human volunteer similar to those of the outbreak. Washed viable organisms did not produce any symptoms. The outbreak seems, therefore, to have been due to a preformed heat-stable toxin produced by the α-haemolytic streptococci in those portions of the pudding where conditions were favourable for growth.

—A. MAYR-HARTING.

STEIN, C. D. (1947.) **Some observations on the tenacity of** *Bacillus anthracis*.—*Vet. Med.* **42.** 13–22. **396**

Experiments are recorded which demonstrate the resistance of *B. anthracis* in whole carcasses and in tissues of g. pigs exposed to varying conditions of decomposition, temperature and desiccation. It is concluded that *B. anthracis* is rapidly eliminated by decomposition from unopened carcasses of g. pigs after the third day except under winter temperatures when it survives at least four weeks. Examination of the contents of the colon and rectum for spores of germinative organisms which have escaped decomposition is an unreliable diagnostic procedure in g. pigs. Repeated freezing and thawing may kill vegetative forms, but probably not spores. Sporulating cultures maintained for 124 days at –60° to –70°C., and for nine to ten years at either –5° to –6°C. or 5° to 10°C. were still viable. Blood swabs from field cases of anthrax kept in the light at room temperature for periods up to nine years were still virulent.

—K. G. TOWERS.

GLOVER, R. E. (1946.) **Susceptibility of the golden hamster** (*Cricetus auratus*) **to** *Mycobacterium tuberculosis hominis* **and** *bovis*.—*J. Path. Bact.* **58.** 107–110. **397**

In experiments, the details of which are summarized, to determine the smallest dose of virulent human and bovine tubercle bacilli capable of producing infection when given subcutaneously, it was found that the golden hamster was as susceptible as the g. pig. Caseous lesions were rare in the hamster. There was a striking proliferative adenitis, the glands teeming with acid-fast bacilli.—W. R. BETT.

BLOCH, H. (1948.) **The effect of chick embryo extract on the growth and morphology of tubercle bacilli.**—*J. exp. Med.* **88.** 355–360. [Summary copied *verbatim*.] **398**

Aqueous extracts of 11-day-old chick embryos enhance the growth of tubercle bacilli in oleic acid-albumin media. These extracts also increase the tendency of virulent strains to exhibit the serpentine pattern of growth and confer this property on avirulent variants which normally grow unoriented in clumps. Growth in the presence of chick embryo extract slightly increases the virulence of the virulent strains but does not confer virulence on the avirulent variants.

RAFFEL, S., & FORNEY, J. E. (1948.) **The rôle of the "wax" of the tubercle bacillus in establishing delayed hypersensitivity.**—*J. exp. Med.* **88.** 485–502. [Authors' summary copied *verbatim*.] **399**

The purified wax fraction of the tubercle bacillus, which has been previously demonstrated as an essential element in causing delayed tuberculin hypersensitivity in response to the protein of the tubercle bacillus, is now found to have the same activity with regard to a simple chemical antigen, picryl chloride. One injection of this

compound with wax intraperitoneally into guinea pigs results in a marked delayed cutaneous hypersensitivity, demonstrable by contact and intracutaneous test, and of long duration. The effect is not related to an adjuvant activity of the wax as defined by ordinary standards.

The relationship of these observations to the occurrence of "heteroallergic" phenomena in tuberculosis is discussed. The possibility that the occurrence of spontaneous contact hypersensitivities may depend upon the presence of similarly active lipoidal components of the skin is commented upon.

SUÁREZ-MANTILLA, C. (1946.) Vitamina C en tuberculosis. **[Vitamin C in tuberculosis.]**—*Publ. Fund. Biogen., Caracas.* No. 5. pp. 5–110. [Abst. in *Bull. Hyg., Lond.* **22.** 241. (1947.) copied *verbatim.* Signed: H. HAROLD SCOTT.] **400**

The investigations on which this article is based must have necessitated much arduous and probably very tedious work, but it is well that it should have been done once and there is little likelihood, or need, for repeating it. It does not lend itself to abstraction; the latter half at least consists of tables and figures which cannot be condensed and those interested must consult the original. Here we can do little more than indicate the contents.

The authors start with a brief note on scurvy and vitamin C; they then pass on to the methods of determination and estimation of ascorbic acid and to quotations from the literature regarding the effect on different organs of the vitamin or its lack in tuberculous laboratory animals. Next, they discuss the vitamin C requirements in normal and tuberculous subjects and the presence and estimation of ascorbic acid in the urine and in the blood of tuberculous patients. All this is by the way of introduction. They then present series of tables with lists of patients, men, women, and children separately, giving their ages, the amount of vitamin C in mgm. per cent., fasting and after the taking of 200 mgm.; a column is included showing the increase and the index, the amount in the urine and other information. The findings are presented not only in tables, but also in graphs with a few words of letterpress on each.

DAVIS, B. D., & DUBOS, R. J. (1947.) **The binding of fatty acids by serum albumin, a protective growth factor in bacteriological media.**—*J. exp. Med.* **86.** 215–228. [Authors' summary copied *verbatim.*] **401**

Serum albumin is a protective bacterial growth factor; by binding traces of fatty acid in the media it permits initiation of growth by the smallest possible inocula of tubercle bacilli. Each molecule of albumin binds 3 to 6 molecules of oleic acid (1 to 2 per cent of the weight of the albumin) tightly enough to prevent bacteriostasis, and 9 molecules of oleic acid in equilibrium with a saturated neutral solution. The property requires undenatured albumin. Crystalline β-lactoglobulin has a smaller capacity, and a number of other proteins no perceptible capacity to bind oleic acid.

The inhibitory effect of the commercial product Tween 80 (polyoxyethylene sorbitan monooleate) on the growth of small inocula of tubercle bacilli in liquid media is caused by its content of unesterified oleic acid (0·6 per cent by weight). Purified Tween 80, freed of this contaminating fatty acid, not only permits growth of small inocula, but protects against small amounts of added oleic acid.

The implications of the binding capacity of albumin for its possible physiological significance in the animal body (transport; protection against cytotoxins), and for the structure of the protein, are briefly discussed.

PARAF, J., DESBORDES, J., & LOUBRY, G. (1946.) Réaction de la déviation du complément avec des sérums de tuberculeux par un antigène entièrement synthétique: acide gras $\alpha\alpha$-disubstitué. **[Complement fixation in tuberculosis with a synthetic antigen.]**—*Ann. Inst. Pasteur.* **72.** 453–456. **402**

An aqueous emulsion of the $\alpha\alpha$-disubstituted fatty acid

$$CH_2{=}CH{-}9(CH_2){-}\underset{\underset{CH_3}{|}}{\overset{\overset{CH_3}{|}}{C}}{-}COOH$$

was used as antigen in a series of tests, the linear fatty acid oleic acid being used as a control. With sera from 20 tuberculous patients the test antigen gave 13 positive results and seven negative. With sera from five healthy individuals the test antigen gave results which were uniformly negative. The sera of five BCG-vaccinated horses all gave negative results. All the tests with oleic acid were negative.—L. M. MARKSON.

BLAHD, M., LESLIE, E. I., & ROSENTHAL, S. R. (1946.) **Infectiousness of the "closed case" in tuberculosis.**—*Amer. J. publ. Hlth.* **36.** 723–726. [Abst. from abst. in *Bull. Hyg., Lond.* **21.** 732–733. (1946). **403**

The authors carried out tests of a comprehensive kind with tuberculin in non-contact children and children in contact with "closed" cases of tuberculosis.

The children in "contact" with closed cases of tuberculosis had a marked and an increasingly

larger proportion of "positives" as compared with the "non-contacts" as age advanced. This finding was expected as the numerous observers of such children, quoted in the paper, have all found that children in contact with "closed" cases of tuberculosis are invariably intermediate between those in contact with "open" cases on the one hand and "non-contacts" on the other. The authors conclude that "although a so-called 'closed' case is not as grave a source of infection as a frankly open one, it is more insidious," and recommend that the description of cases as "closed" be dropped, in the interests of the public, until such time as a truly conclusive test applicable to all persons who have had tuberculosis be found. A footnote applying the formula of significance of the differences between the proportions is very striking.

WELLS, W. F., RATCLIFFE, H. L., & CRUMB, C. (1948.) **On the mechanics of droplet nuclei infection. II. Quantitative experimental air-borne tuberculosis in rabbits.**—*Amer. J. Hyg.* **47.** 11–28. [Summary and conclusions copied *verbatim*. For previous part, see *V. B.* **18.** 441.] **404**

Experimental air-borne tuberculosis in rabbits has been quantitated by improved apparatus and techniques. Droplet nuclei of uniform settling velocities were generated and their settling velocity was measured. Homogeneous suspensions of tubercle bacilli were cultured as separate cells. These organisms were quantitated with an improved medium. Uniform aerosol suspensions containing these homogeneous organisms were quantitatively added to the air breathed by rabbits and the concentration determined. Nuclei settling less than a tenth of a foot per minute in still air penetrated quantitatively to the lung and were planted upon the alveolar surfaces throughout the lung. In 4 or 5 weeks visible tubercles developed where the organisms had been planted, and these were quantitated in vivo as colonies are counted in vitro on solid media. As quantitative technique improved, parity between the number of tubercle bacilli inhaled in small nuclei and the number of tubercles in the lung was approached, a single cell inducing the development of a tubercle. Within the precision of the experiments, the lung of the normal rabbit proved to be homogeneous with respect to growth of the Ravenel strain of bovine tubercle bacillus. Less than 10 per cent of nuclei settling a foot per minute reached the lung; organisms in the remainder apparently did not affect the rabbit. More than 10,000 bacilli from a culture producing tubercles in the lung were ingested without observable effect. Resistance acquired by prior infection modified the quantitative relation between the number of organisms inhaled and the number of tubercles produced by reinfection.

We conclude that inhalation of few tubercle bacilli, in the nuclei of droplets coughed or sneezed into the atmosphere, is of greater consequence than far larger numbers of organisms in coarse particles which are strained out in the upper respiratory passages and ingested.

STACEY, M., & WEBB, M. (1948.) **Some components of the lytic system of Gram-positive micro-organisms.**—*Nature, Lond.* **162.** 11–13. **405**

In studies on autolysis in cultures of Gram-positive bacteria two stages were demonstrated: a change of staining properties from Gram-positive to Gram-negative and lysis of the Gram-negative cytoskeleton.

The first stage appeared to be brought about by enzymes of the ribonuclease type liberated by the organisms. The action is species specific and almost strain specific, has an optimum pH for different organisms, and is prevented by heating to 80°C. for 30 min. Further study showed that the species specificity is due to an ability to liberate the specific polysaccharides from their linkage with the ribonucleic acid, the former going free in solution, the latter being then attacked by the ribonuclease. The first lysozome action is the specific action, the second action is non-specific, and alters the Gram-staining characters.

The second stage, the lysis of the Gram-negative cytoskeleton is carried out by a non-specific proteolytic enzyme.

The authors suggest that a similar enzyme system may be possessed by leucocytes.—R. M. L.

GIFFORD, R., & JUNGHERR, E. (1947.) **Listeriosis in Connecticut with particular reference to a septicemic case in a wild raccoon.**—*Cornell Vet.* **37.** 39–48. **406**

The authors state that since the discovery of the first case of bovine *Erysipelothrix* (*Listeria*) *monocytogenes* infection in Connecticut in 1937 the disease has been diagnosed in their laboratory in a number of sheep and also in a few goats, cows and rabbits. Usually the brains were affected and the animals had nervous symptoms, but lesions sometimes occurred in other organs as well. The authors also report a case of septicaemic listeriasis in a racoon submitted dead to their laboratory, and believe this to be the first record of the disease in wild animals in the U.S.A.—E. K.-N.

CHILTON, M. L., & FULTON, MACD. (1946.) **A presumptive medium for differentiating paracolon from salmonella cultures.**—*J. Lab. clin. Med.* **31.** 824–827. **407**

A multiple sugar medium is recommended consisting of a broth base with 0·5% each of

adonitol, aesculin, salicin and sucrose, using bromcresol purple and ferric ammonium citrate as indicators. None of these carbohydrates is fermented by salmonella, whereas paracolon organisms usually ferment one or more of them. If used in conjunction with Kovacs' test for indole, 80% of paracolon organisms can be rapidly identified.—A. MAYR-HARTING.

I. BENNETT, I. L. (1948.) **Observations on the fever caused by bacterial pyrogens. I. A study of the relationship between the fever caused by bacterial pyrogens and the fever accompanying acute infections.**—*J. exp. Med.* **88.** 267–278. [Summary and conclusions copied *verbatim.*] **408**

II. BENNETT, I. L. (1948.) **Observations on the fever caused by bacterial pyrogens. II. A study of the relationship between the fevers caused by bacterial pyrogens and by the intravenous injection of the sterile exudates of acute inflammation.**—*Ibid.* 279–284. [Summary and conclusions copied *verbatim.*] **409**

I. The relationship between the fever of acute infection and that following injection of bacterial pyrogen was studied by administering pyrogens to animals convalescent from acute infections.

Rabbits surviving dermal pneumococcal infections or peritonitis due to *Escherichia coli* were given intravenous injections of typhoid or *E. coli* vaccine. They showed no evidence of tolerance to the fever-promoting effect of these pyrogenic materials.

Tolerance did develop in infected animals given daily pyrogen injections during the course of the infection.

Certain previous observations upon the ability of rabbits to develop tolerance to pyrogens, the broad nature of the tolerance, and its duration were confirmed.

It is concluded that the pyrogen produced by certain bacteria plays little or no rôle in the production of the fever of infection.

These findings are compatible with the hypothesis that there is a common factor, perhaps a product of cell injury, underlying the fever accompanying diseases of various types.

II. The relationship of the fever caused in rabbits by bacterial pyrogens to the fever produced by the injection of the sterile exudates of acute inflammation was investigated by recording the responses of normal and pyrogen-tolerant animals to injections of exudate. Exudates were produced by the intrapleural injection of turpentine in dogs.

The duration of the febrile response in rabbits after a single dose of exudate was found to be much shorter than the fever following an injection of bacterial pyrogen.

Animals given daily injections of exudate demonstrated no tolerance to its fever-promoting effect.

Animals tolerant to bacterial pyrogens showed no diminution in responsiveness to exudates.

Daily injections of exudate failed to establish tolerance to bacterial pyrogens in rabbits.

It is concluded that the fever-promoting property of sterile exudates is not due to the presence of bacterial pyrogen.

PENHA, A. M., & D'APICE, M. (1946.) Contribuição ao estudo da enterite infecciosa dos bezerros. I. Importancia da "Salmonella dublin" na etiologia dessa molestia em São Paulo. **[Infectious diarrhoea of calves. I. The importance of *Salmonella dublin* as a cause of the disease in São Paulo.]**—*Arq. Inst. biol., S. Paulo.* **17.** 239–248. [English summary.] **410**

Of 51 samples (marrow from metacarpal bones taken from calves dead of infectious diarrhoea), 49 contained *Salmonella dublin.* The author discusses the presence of *Bact. coli* reported by others in the bodies of calves similarly affected.—R. MACGREGOR.

GRUNSELL, C. S., & OSBORNE, A. D. (1948.) **Salmonella dublin infection in adult cattle.**—*Vet. Rec.* **60.** 85 & 86. **411**

Outbreaks of *S. dublin* infection on five farms are reported. Four of the farms were self-contained, and no source of infection could be traced. Diagnosis was based on the isolation of the organism from the faeces of affected cattle, and in two cases from the milk also, within three days of the onset of symptoms. The agglutination test was found to be useless for diagnosis during the acute stage, a satisfactory titre not being established for some time after this stage. Of seven affected cows, two died.—R. M. LOOSMORE.

WOLFF, A. H. (1947.) **The public health significance of animal salmonella infections.**—*J. Amer. vet. med. Ass.* **111.** 474–480. **412**

The changes that have occurred in our outlook on salmonella infections are traced. Some years ago most salmonella were thought to be host-specific and only a few of them to be capable of causing food-poisoning in man. When the antigenic structure could be accurately ascertained, it was found that host-specificity was lacking and that all salmonella organisms were capable of causing infections in animals and man; and although certain clinical conditions are most commonly associated with certain types, any particular *Salmonella* may cause gastroenteric as well as septicaemic symptoms. The various animal and other sources of salmonella infections are then discussed in detail.—A. MAYR-HARTING.

KAUFFMANN, F. (1948.) A propos de la sérologie des *Salmonella*. **[Salmonella typing.]**—*Ann. Inst. Pasteur.* **74.** 478–484. **413**

A simplified re-arrangement of the Kauffmann-White scheme containing all *Salmonella* types known up to the end of 1946 with a few added explanations.—A. MAYR-HARTING.

KAUFFMANN, F., & VAN OYE, E. (1947.) **A new Salmonella type (*S. kisangani*) from the Belgian Congo.**—*Acta path. microbiol. scand.* **24.** 614–615. [In English.] **414**

The authors isolated this type of salmonella twice from human sources. Its O-antigens and non-specific phase H antigens are identical with those of *S. paratyphi* B, the specific phase H antigen corresponds to that of *S. paratyphi* A. The complete antigenic formula is I, IV, V, XII : a : 1, 2.—A. MAYR-HARTING.

KRISTENSEN, M. (1948.) **Mutative bacterial fermentation.**—*Acta. path. microbiol. scand.* **25.** 244–247. Discussion pp. 247–248. [In English.] **415**

Arabinose-fermenting mutants of *Salmonella dublin* were investigated. It was found that the older the culture the more frequent were the mutations. In this increased frequency, both the age of the culture and the contact with the sugar played a part. The fermentative behaviour of typhoid bacilli with regard to xylose, dulcite, arabinose and rhamnose was examined. A few examples of "coupled" mutations were found, but mostly they occurred independently. Slow fermentation of various sugars, which was found in a number of salmonella and coliform organisms, could be due either to a primary ability for slow fermentation of a particular sugar or to a mutational change in a primarily non-fermenting strain.—A. MAYR-HARTING.

—. (1944.) **New pullorum testing laboratory.**—*Bull. Calif. Dep. Agric.* **33.** 207–208. **416**

A short description of the new laboratory built by the Northern California Pullorum Control Board. It provides additional laboratory facilities for the Official Pullorum Disease Programme, a self-supporting scheme administered by the Division of Animal Industry, State Department of Agriculture.—J. D. BLAXLAND.

GIULIANI, V. (1945.) Brucellosi "latente" professionale (inchiesta in una zona rurale del barese). **[Latent brucellosis. An inquiry in a rural district of Bari.]**—*Ann. Igiene. (sper.).* **55.** 116–118. [Abst. in *Bull. Hyg., Lond.* **22.** 250. (1947), copied *verbatim*. Signed: H. HAROLD SCOTT.] **417**

Several authors have reported the results of their investigations into infection by Brucella of those in frequent contact with animal reservoirs of infection—slaughterers, butchers, shepherds, stablemen, etc., having to do with cattle, goats, sheep and pigs—the percentages ranging from 6 or so to 50 or more.

The present author has studied the question in Santeramo, Bari Province, where notifications for human brucellosis in the five years 1936–40 were 374·64 per 10,000, and of 1,617 goats tested 42, or 2·6 per cent., were positive. Among 27 persons examined, engaged as above stated, the sera of ten agglutinated [this is called 37 per cent.]. Four at 1 : 20, three each at 1 : 40 and 1 : 80. Three agglutinated *Br. melitensis*, one *Br. abortus*, two *Br. paramelitensis*, two all in equal titre, two the two latter, but higher for *abortus*. They had shown no symptoms and are consequently regarded as "latent" cases, infected by frequent inoculation of small doses of the organism.

ELBERG, S. S., & HENDERSON, D. W. (1948.) **Respiratory pathogenicity of brucella.**—*J. infect. Dis.* **82.** 302–306. **418**

G. pigs were exposed to aerosols containing known concentrations of *Brucella suis* or *Br. melitensis*. A quantitive relationship was found to exist between the number of organisms in the aerosol, and the number of g. pigs infected. The $I.D._{50}$ with *Br. suis* was estimated at 36 organisms; this is not much less virulent than the subcutaneous infection where the $I.D._{50}$ is supposed to be 5 organisms. The lesions were not localized in the lungs, but distribution was similar to that of lesions in subcutaneous infections, namely an enlarged and congested spleen and granulomata in the liver. The animals infected by the respiratory route had in addition enlarged bronchial and cervical lymph nodes. On the other hand, these animals rarely had an infected epididymis, whereas this organ is frequently involved in subcutaneous infections.—A. MAYR-HARTING.

KARSTEN. (1944.) Ueber die CO_2-Empfindlichkeit der frisch aus dem Rinderkörper gezüchteten Stämme von Brucella abortus Bang. **[CO_2 sensitivity of *Br. abortus* freshly isolated from cattle.]**—*Berl. Münch. tierärztl. Wschr./Wien. tierärztl. Mschr.* January 21st. 28–30 & February 4th. 41–43. **419**

K. reported his experiments with CO_2 sensitivity of freshly isolated strains of *Br. abortus*. He found that there was considerable variation: some strains grew without CO_2 after two or three sub-cultures, others after ten. He reported on 38 cultures from calf foetuses and on results with 509 milk samples.

He states that in some of the cows examined, the organisms from one or more quarters grew without CO_2, while organisms from other quarters were CO_2 sensitive. He even found that milk

from an individual cow might contain CO_2 sensitive organisms one day and organisms that grew without CO_2 on another.

K. speculates concerning the origin of *Br. abortus*, suggesting that it is merely a variant of *Br. melitensis*.—P. SASSE.

MOORE, T., & MITCHELL, C. A. (1948.) **Vaccination of sexually mature cows with *Brucella abortus* Strain 19. I. Negative cows contained in negative dairy herds.**—*Canad. J. comp. Med.* **12.** 278–282. **420**

Forty-five non-pregnant and 68 pregnant cows in three negatively reacting herds were vaccinated with *Br. abortus* strain 19. Two years later, 17·7% of the former and 60% of the latter had remained reactors. One of the non-pregnant vaccinated group aborted and a strain other than No. 19 was demonstrated; 18 calved normally and milk and uterine exudate were negative. Specimens of milk and uterine exudate from 44 of the pregnant vaccinated cows, all of which calved normally, were tested; *Br. abortus* was recovered from the cream of two and from the cream and uterine exudate of one after the first gestation period, and from the cream of one after completion of the second pregnancy.—R. GWATKIN.

COLEMAN, M. B. (1945.) **Strain of *Brucella abortus* used for vaccination of calves; pathogenic for man.**—*Ann. Rep. Div. Lab. Res. N.Y. St. Dept. Hlth, 1945.* p. 51. **421**

Two veterinarians who pricked themselves while inoculating calves with *Br. abortus*, strain 19, vaccine developed illness attributed to but not proved to be *Br. abortus* infection.—E. K.-N.

KARSTEN. (1947.) Wie hat die Bekämpfung der Bruzellosen, insbesondere des Abortus Bang auf Grund unserer heutigen Kenntnisse zu erfolgen. **[Brucellosis control.]**—*Dtsch. tierärztl. Wschr.* **54.** 17–24. **422**

A conventional general discussion.—J. JONAS.

ELBERG, S. S., & GLASSMAN, H. N. (1947.) **Viability of *Brucella suis* on storage in liquid culture.**—*Amer. J. vet. Res.* **8.** 314–316. **423**

The viability and virulence of aerated broth cultures of *Brucella suis* were stabilized by the addition of dextrin or ascorbic acid or by a combination of both. After two months' storage at 20–25°C. they had retained their original viable count.—A culture stabilized by dextrin alone still contained 25% of its viable organisms after 175 days of storage, while its virulence was not reduced.—E. KLIENEBERGER-NOBEL.

LAFENÊTRE, M. (1947.) La lutte contre la mélitococcie ovine et caprine. **[Control of *Brucella melitensis* infection in sheep and goats.]**—*Bull. Off. internat. Epiz.* **27.** 1–22. **424**

In France *Br. melitensis* infection in sheep and goats is confined to the southern region where the disease is reported to be increasing in intensity. Goats are chiefly responsible for the spread of this disease to human beings owing to the consumption of fresh milk and cheese. Vaccination with a living avirulent culture of *Br. abortus suis* prepared by Dubois has not been entirely successful and it is suggested that strain 19 might give greater protection. Methods of diagnosis and control are discussed.—J. I. TAYLOR.

PARKER, W. H. (1948.) **Black disease in Shropshire and the prophylactic effect of *Clostridium oedematiens* serum.**—*Vet. Rec.* **60.** 417. **425**

Death from "black disease" (localized hepatitis due to a combination of *Clostridium oedematiens* infection and *Fasciola hepatica* infestation) occurred in the autumn four years in succession in ewes and occasionally in wethers in England, up to 40% of the flock being affected. It is stated that the use of *Cl. oedematiens* antiserum stopped the losses.—R. M. LOOSMORE.

HELSON, V. A., STEVENSON, J. W., & REED, G. B. (1947.) **Yield of botulinum toxin in concentrated media.**—*Canad. J. Res.* Sect. E. **25.** 25–32. **426**

In a previous paper [see *V. B.* **18.** 403] the authors described a method of obtaining large and consistent yields of the toxins of *Clostridium botulinum* types A and B in a medium consisting of casein digest, cornsteep [maize steep] and glucose. This paper presents a modification of this procedure which results in a significant increase in toxin production. The cultures are grown in the usual manner for ten hours, then concentrated medium is added by the continuous drip method for 18–60 hours until the concentration of the medium has been doubled or quadrupled. Whereas in the unconcentrated medium growth ceases in 18–20 hours, with the modified method it continues for some 40 hours with an increase of 2–3 times in yield of toxin.—C. E. R.

ROLLINSON, D. H. L. (1948.) **Infectious diarrhoea of dairy cows.**—*Vet. Rec.* **60.** 191–192. **427**

R. reports a fairly widespread incidence of an acute infectious diarrhoea in dairy cows, chiefly in winter, the condition spreading rapidly in a herd and lasting about four days. The temperature of affected animals was normal or subnormal. The milk yield dropped.

A comparison is drawn between this condition and *Vibrio jejuni* enteritis as reported in America.—R. M. LOOSMORE.

STAVITSKY, A. B. (1945.) **Studies on the mechanism of host resistance in experimental lepto-**

spirosis icterohaemorrhagica.]—*J. Immunol.* **51.** 397–419. **428**

In tests on g. pigs, white mice and rats of varying ages it appeared to S. that the resistance of g. pigs to this leptospirosis was weak. The resistance of mice and rats was relative rather than absolute, as was shown by the high incidence of haemorrhagic pulmonary lesions in these animals when experimentally infected.

He demonstrated that the organisms were not fixed at the site of inoculation and attributed their rapid spread to their shape and motility. Only uninjured skin and the nasal mucous membrane prevented invasion in mice, rats and g. pigs by leptospira. The evidence presented indicated that whole blood serum and cell-free inflammatory exudates had no demonstrable effect on the organisms. Leptospira were not cleared from the blood of normal g. pigs, mice and rats during the first 48 hours after intracardiac inoculation and there was no appreciable fluctuation in the numbers of circulating organisms.

S. was unable to demonstrate phagocytosis of the spirochaetes and suggests as possible explanations for this, one or more of the following factors :– a very slow sedimentation rate of the organisms, their ability to wriggle through dense fibrin networks, their large surface area and irregular shape, and the fact that they have a positive electrical charge. All attempts to demonstrate the production of a leucocidin by these organisms failed. He suggested that antileptospiral bodies were produced by absorption of soluble antigens without phagocytosis of the whole organism and claims in support of this, that g. pigs may be protected against leptospirosis by immunization with spirochaete-free filtrates of leptospiral cultures. The production of antibodies with lytic properties appeared to be the only factor studied which affected leptospira both *in vivo* and *in vitro*. This, S. states, agrees with the humoral mechanism of immunity met with in other spirochaetal infections.—A. R. JENNINGS.

SENTHILLE, F., DE BAYO, P., & KOLOCHINE-ERBER, B. (1946.) Existence dans la région parisienne d'une leptospirose canine transmissible à l'homme. [**Canine leptospirosis in Paris, transmitted to man.**]—*Rev. Path. comp.* **46.** 161–163. **429**

An account of illness in three human beings and of the evidence that the infection was acquired from dogs.

The human patients' serum yielded an agglutinin titre of 1 : 5,000,000 in one case, of 1 : 100,000 in the second, and of 1 : 150,000 in the third to *L. canicola* and 1 : 500,000, 1 : 10,000, and 1 : 100,000 respectively to *L. icterohaemorrhagiae* and agglutinin absorption tests were made.

Dogs with which there was contact were found to be infected, with titres of up to 1 : 200,000 to *L. canicola* and a lower titre to *L. icterohaemorrhagiae* and leptospira were present in the urine of the dogs.

The infection did not cause obvious illness in the dogs.—M. R. ORMEROD.

KOLOCHINE-ERBER, B., & COLLOMBIER, M. (1945.) Agglutination de *Leptospira canicola* par des sérums humains. [**Agglutination of *L. canicola* by human sera.**]—*C.R. Soc. Biol. Paris.* **139.** 489–491. **430**

During the period 1937–43 the authors carried out agglutination tests for *L. icterohaemorrhagiae* and *L. canicola*, with 526 samples of human serum from suspected cases of leptospirosis.

With 418 of the samples the reactions were negative. Twelve samples agglutinated either *L. canicola* or *L. icterohaemorrhagiae* at dilutions of less than 1 : 1,000, a result considered of no significance. Eleven samples agglutinated *L. icterohaemorrhagiae* at 1 : 50,000, but gave no agglutination for *L. canicola*. In 80 samples the titre was higher for *L. icterohaemorrhagiae* than for *L. canicola*, 1 : 1,000,000 and 1 : 100,000 respectively, showing that although with experimental sera there seems to be a more or less definite ratio between agglutinins and co-agglutinins, with sera from natural infections there is no such relation. Of the five remaining samples, which gave higher agglutination titres for *L. canicola* than for *L. icterohaemorrhagiae*, two gave very low figures (1 : 1,000 for *L. icterohaemorrhagie*, and 1 : 8,000 for *L. canicola*). One agglutinated *L. icterohaemorrhagiae* at 1 : 50,000 and *L. canicola* at 1 : 200,000. No further information could be obtained about this case; at the time it was considered to be a human infection with *L. canicola*, but in the absence of further tests had to be regarded as doubtful. One agglutinated *L. icterohaemorrhagiae* up to 1 : 50,000 and four strains of *L. canicola* up to 1 : 100,000. A g. pig inoculated with the patient's urine developed a typical *L. icterohaemorrhagiae* infection, while the serum of rabbits inoculated with *L. icterohaemorrhagiae* agglutinated the strain of leptospira obtained from the patient at almost the same degree as the strain of *L. icterohaemorrhagiae* used to inoculate the rabbits. The balance of evidence was decided to be in favour of a *L. icterohaemorrhagiae* infection. One agglutinated *L. icterohaemorrhagiae* at 1 : 10,000 and *L. canicola* at 1 : 200,000. Other species of leptospira, *e.g.*, *L. grippotyphosa*, either failed to agglutinate with this serum at all or gave very low figures, 1 : 200. Absorption tests were carried out to show the specificity of the agglutinins in this serum for

L. canicola. The case was concluded to be one of human infection with *L. canicola*.—M. R. O.

VAN THIEL, P. H. (1946.) Komt Leptospirosis pomona in Nederland bij het varken voor? [*Leptospira pomona* **infection in pigs in the Netherlands.**]—*Tijdschr. Diergeneesk.* **71.** 642–643. **431**

This is a suggestion that *L. pomona* infection occurs in swine in Holland, in parts of which a disease occurs which resembles *Leptospira pomona* infection seen in Switzerland and elsewhere. No serological evidence on this question is yet available in Holland.—J. E.

WEINMAN, D. (1944.) **Infectious anemias due to Bartonella and related red cell parasites.**—*Trans. Amer. phil. Soc.* **33.** 243–350. **432**

This comprehensive review consists of four chapters, two of which, namely, "Haemobartonella and animal bartonellosis" and "Eperythrozoon and eperythrozoönosis", are of especial veterinary interest. In addition, there is a very good bibliography in which the South American literature is particularly well represented. In a preface by Tyzzer it is pointed out that there has been a notable tendency to regard all blood parasites as protozoa, but that the cultivation of *Bartonella bacilliformis* has led to its recognition as a bacterium; the *Grahamella* of various animals have also been cultivated and are obviously bacteria. Recent studies lend no support to the view that either haemobartonella or eperythrozoa are of the nature of protozoa. It seems that the whole group should fall within the domain of the bacteriologist.

Although there is very much of interest in the sections on human bartonellosis, this abstract is confined to the two sections dealing with animal infections.

Twenty-one species of haemobartonella in various species of animals have been described. Of these *H. muris*, the cause of an infectious anaemia in rats, has been the most completely studied. The disease is world wide in distribution. The oganism occurs on the red corpuscles, but may also be seen free in the plasma and has been found in the urine. Many reports of its cultivation have been made, none of them completely satisfactory; details are given of the media used by those who have attempted cultivation. Transmission is by ectoparasites of the rat such as the rat louse *Haematopinus spinulosus*. Premunition is a feature of the disease and splenectomy is followed by a flare-up of the infection. Intact rats remain infected for very long periods, but the splenectomized rat rids itself of infection after recovery. Therapy is by arsenical compounds and true sterilization of a latent or declared infection has been obtained. The symptoms consist of loss of appetite, rapid loss of weight and marked pallor. The temperature may be slightly raised, there may be a slight conjunctivitis and dyspnoea is a marked feature. Haemoglobinuria is frequently present and occasionally haematuria. Parasites may be found in the blood from one to five days before anaemia occurs; they persist from 7–35 days. Shortly before death a crisis may occur and all, or almost all, the parasites may disappear from the blood. Lesions consist of icterus of the subcutaneous tissues and viscera; fluid may be present in the pleura, peritoneum and pericardium; the intestines are congested, the liver enlarged, softened and pale yellow in colour; the kidney is dark in colour when haemoglobinuria has occurred, otherwise it is pale and swollen; in the lungs punctiform haemorrhages, small foci of pneumonia and small abscesses may occur; the spleen is soft and swollen.

H. bovis has been recorded from Algeria and Palestine. The incubation period is from 13–53 days. Splenectomy of recovered animals provokes a second attack. Clinical signs are slight or absent.

H. canis has been recorded from Europe, India, Africa, and America. The incubation period is from 3–10 days. The symptoms are anaemia, loss of weight, fever and dyspnoea; repeated relapses are a feature. Lesions resemble those described in rats affected with *H. muris*. Transmission is probably by a haemotophagous arthropod. The organism is very pleomorphic: rods, dumbbell-shaped organisms, dots, rings and coccoids have all been described; they stain red with Giemsa stain. The disease is more acute in young animals. Treatment with neoarsphenamine in a dose of 15 mg. per kg. bodyweight can result in complete sterilization.

H. sturmani has been described by GRINBERG [see *V. B.* **10.** 416] from a splenectomized buffalo in Palestine. The eperythrozoa are blood parasites similar to *Haemobartonella* and cause diseases in which anaemia is a prominent symptom; arthropod transmission has been established for one species; seven species are described. Of especial veterinary interest are *E. ovis* and *E. wenyoni*. *E. ovis*, first recorded from S. Africa, has since been found in Algeria, Iran, France and the U.S.A. The incubation period is from 2–27 days. Symptoms are fever, anaemia and jaundice; a fatal termination is exceptional. *E. wenyoni* in cattle has been reported from Palestine, S. Africa, Equatorial Africa, Iran, France, the U.S.A., Algeria and Holland. It is only slightly pathogenic, producing a mild anaemia without fever or clinical signs. Transmission is believed to be by ticks or other ectoparasites.—M. C.

SHROPSHIRE, R. F. (1947.) **Bacterial dispersion by sonic energy.**—*J. Bact.* **54.** 325–331. **433**

It was found that when bacteria occurring in aggregates were subjected to sonic energy, they were dispersed in such a way that the suspensions were composed of individual organisms only. With a turbidimetric method it was shown that an increase in turbidity took place at the same time. A method is suggested for the preparation of well dispersed suspensions of viable organisms.

—E. KLIENEBERGER-NOBEL.

ROSEBURY, T., KABAT, E. A., & BOLDT, M. H. (1947.) **Bacterial warfare. A critical analysis of the available agents, their possible military applications, and the means for protection against them.**—*J. Immunol.* **56.** 7–96. **434**

An attempt to evaluate the possibilities of bacterial warfare from a study of the literature on the subject and of the pertinent data supplied by bacteriology, epidemiology and public health. The suitability of potential agents of warfare is discussed with respect to their casualty effectiveness, supply, resistance of the agent, transmissibility, epidemicity, ease of detection, availability of remedial measures and their possible persistence and retroactivity. The infectious diseases are divided into five groups:—A, food and water borne; B, contact; C, air borne; D, vector borne; and E, endogenous. Group E is of no consequence, and group A is considered to have been virtually eliminated by modern sanitary safeguards. Group C has only a limited applicability, such as the contamination of projectiles with spores of anthrax or one of the clostridia, and group D is dependent on conditions being appropriate for their development, such as the presence of vectors and of reservoir hosts. Thus group C includes the largest number of, and probably the most important, potential infective agents.

The diseases selected for consideration as being possibly suitable for bacterial warfare are anthrax, botulism, brucellosis, the common cold, dengue fever, dysentery, equine encephalomyelitis, foot and mouth disease, fowl plague, glanders, swine fever, infectious laryngo-tracheitis, influenza, leptospirosis, louping ill, malaria, melioidosis, meningococcal meningitis, mumps, bovine contagious pleuro-pneumonia, psittacosis, tick-borne relapsing fever, rickettsial diseases, Rift Valley fever, rinderpest, tularaemia, yellow fever and certain plant diseases. The diseases which affect man are discussed in considerable detail with respect to their relevant characters, and those which give the greatest possibilities appear to be anthrax, influenza, psittacosis, glanders, *Pfeiferella whitmori* infection (melioidosis), tularaemia, undulant fever, Rift Valley fever, dengue fever and equine encephalomyelitis. The difficulties to be overcome before these agents can be used successfully are pointed out, and methods of detection with counter measures are discussed.

The agents which might be used for attacks on animals and plants are not discussed in so much detail. It is interesting to note that the authors suggest that Germany intended, and perhaps attempted, to use the glanders bacillus in 1916, and also that in the recent war Japan attempted to disseminate plague in China by means of infected fleas.—U. F. RICHARDSON.

See also absts. **488** (TB. allergy); **569** (*Streptococcus pyogenes* and penicillin); **585** (staphylococci in condensed milk); **586** (meat inspection); **589** and **590** (*Corynebact. pyogenes* vaccination); **609** (handbook of practical bacteriology).

DISEASES CAUSED BY PROTOZOAN PARASITES

FAIRBAIRN, H., CULWICK, A. T., & GEE, F. L. (1946.) **A new approach to trypanosomiasis.** —*Ann. trop. Med. Parasit.* **40.** 421–452. **435**

In Part I of this article the hypothesis "that trypanosoma should be considered as bodies carrying an electric charge and obeying the laws governing such bodies" is discussed, and a review is made of the relevant observations by other workers on the electric charges of trypanosomes, the effect of charge on relapse, on antibody formation, red-cell adhesion and other serum reactions, susceptibility to arsenicals, and adaptability and inheritance. From this it is concluded that in their behaviour the polymorphic trypanosomes obey the laws governing charged bodies, and that their properties are maintained in nature by syngamy, which is associated with cyclical transmission, syringe passage producing aberrant strains on which it is dangerous to base conclusions regarding the naturally occurring organisms. Lengthy syringe passage has been found to alter many properties of a strain, and may so seriously impair the capacity for changing the charge that the strain is no longer transmissible by tsetse-fly.

Part II deals with the experimental work of the authors, and an appendix gives a statistical analysis of certain findings.

From observations on stained slides it was found that trypanosomes are not distributed at random, but exhibit attraction or repulsion from the negatively charged blood corpuscles which would be expected in bodies which might be negatively or positively charged, and further that estimates of the percentage of positively charged trypanosomes in a blood specimen, made

by slide examination, agreed closely with the estimates obtained by Broom, Brown and Hoare's technique.

Statistical analysis of the measurement of trypanosomes in thin films of the blood of a rat, infected by the bite of a tsetse-fly, showed that there were three main forms of *T. rhodesiense*, long, intermediate and short, each existing as positively or negatively charged variants. In each case the length of the negatively charged variant was shorter than that of the corresponding positively charged variant. Metacyclic trypanosomes were found to occur in two types, long and short, positive and negative variants of each again occurring.

A process of syngamy is described in which two trypanosomes approached each other and intertwined, their centres in contact, with their anterior and posterior ends at first free but later fusing with each other to produce a fusiform body, which after a time divided at its centre producing two trypanosomes. A similar process is described in *T. simiae*, and head-to-head fusion, which has previously been regarded as a process of aberrant division or agglomeration, is accepted as syngamy because of the nuclear changes observed in both *T. rhodesiense* and *T. simiae*.

It was found that syngamy could be induced in blood trypanosomes by any sudden and marked change in environment, such as suspension in Ringer-glucose, and from experimental evidence it is suggested that syngamy probably takes place between trypanosomes of opposite charge. Trypanosomes in syngamy were frequently seen to extrude granules, but these were never seen to enter other trypanosomes, and are not accepted as gametes.

As the two types of metacyclic trypanosomes produce three blood forms, it is suggested that the genetic structure of metacyclic trypanosomes may be denoted by AA and A′A′, while the blood forms are AA, A′A′ and AA′. As the long form is the only one which reproduces readily by binary fission, the short and intermediate forms being produced from it by a process of syngamy, it is claimed that it must be the heterogonous form AA′. This may explain the difficulty in setting up infection with single trypanosomes, as a single organism of either of the other forms would be incapable of infecting.

Vanderplank's work on the chromosome structure of *T. rhodesiense* was repeated, but it was found that all the forms had six chromosomes. A technique is described for enlarging the nucleus to make the chromosomes resolvable.

The implications of syngamy are discussed, it being pointed out that while it may enable a strain to adapt itself to new environment, it would only be expected to occur when it becomes imperative for the maintenance of the strain, and therefore does not appear in syringe passaged strains.

The occurrence of posterior nuclear forms of *T. rhodesiense* in man is also recorded.—U. F. R.

HARVEY, S. C. (1948.) **Sulfhydryl and disulfide content of normal and arsenic-resistant trypanosomes.**—*Proc. Soc. exp. Biol., N.Y.* **67.** 269–272. **436**

Normal and arsenic-resistant strains of *Trypanosoma equiperdum* do not differ significantly in their sulphydryl content but the former have a considerable surplus of disulphide groups. In *T. hippicum* the arsenic-resistant strain had a higher content of disulphide groups, the sulphydryl content again being similar to that of the normal strain. It is suggested that these differences are not the cause of the resistance but may be the result of some cytological reconstitution which probably gives rise to resistance. The sulphydryl content is of the same order as the degree of arsenic binding.—N. DEAN.

LAUNOY, L., & DAUZIER, M. (1944.) Formation d'anticorps dans les trypanosomoses expérimentales et rôle de la rate. **[The role of the spleen in the formation of antibodies in experimental trypanosomiasis.]**—*C.R. Soc. Biol. Paris.* **138.** 799–801. **437**

The authors describe experiments from the results of which they conclude that, for the development of the temporary immunity to the same strain of *T. brucei* which occurs after chemotherapeutic treatment in rats, the spleen is unnecessary.—J. RICHARD HUDSON.

FAIRBAIRN, H., & BURTT, E. (1946.) **The infectivity to man of a strain of *Trypanosoma rhodesiense* transmitted cyclically by *Glossina morsitans* through sheep and antelope: evidence that man requires a minimum infective dose of metacyclic trypanosomes.**—*Ann. trop. Med. Parasit.* **40.** 270–313. **438**

Views on the relationship of *T. rhodesiense* to *T. brucei* and *T. gambiense* are discussed, and studies are recorded on the transmissibility, virulence and infectivity to man of a strain of *T. rhodesiense* passaged cyclically for ten and a half years through a variety of animals.

The infectivity of a line of this strain maintained in sheep showed a decline followed by a rise, whilst an antelope line showed no significant alteration.

It was found that human beings, who failed to become infected when fed upon by an infected fly, frequently became infected when bitten by the same fly after an interval of some weeks.

An attempt was made to ascertain the dose

of metacyclic trypanosomes required to infect man by inducing flies to probe into a small drop of a fluid, consisting of equal parts of sheep serum and Ringer-glucose solution, placed on a thin film of egg-albumen smeared over the counting chamber of a Turk haemocytometer slide. After some seconds the slide was removed, a cover slip put on, and after the number of trypanosomes had been counted, the whole drop sucked into a syringe. After repeating this process till the syringe was full, the contents were inoculated into the arm of a volunteer. From the results obtained it is suggested that with moderately infected flies man's resistance comes into play, and while 300 metacyclic trypanosomes may be infective to A, B may require a thousand or more. The minimum infective dose of a virulent line may be smaller than that of a less virulent one. It was also shown that there was a better chance of inoculating a higher dose on feeding as a fly aged. This work appears to indicate that 300–450 metacyclic trypanosomes are required to infect the average man, but those with a definite resistance would require a much higher dose.

The influence of the trypanosome strain, the maintenance host, the temperature and the fly on transmissibility and dosage are discussed, it being noted that transmission occurs much more readily with flies emerging from pupae incubated at approximately 30°C.

The virulence of the sheep line of *T. rhodesiense* had decreased between 1934 and 1945, but its infectivity to man was still high, it being suggested that this line is assuming a *gambiense* character. The infectivity of the Thomson's gazelle and monkey lines fluctuated over this period, and flies infected from man infected only a small percentage of human beings on whom they fed, although this does not necessarily mean any loss of infective quality.

It is claimed that the results strongly support the view that *T. rhodesiense* and *T. brucei* must be considered as distinct, and not convertible into one another.—U. F. Richardson.

Ho, E. A., Hsu, T.-H., & Soong, T.-H. (1947.) **Canine visceral leishmaniasis in villages west of Lanchow, China.**—*Trans. R. Soc. trop. Med. Hyg.* **40.** 889–894. **439**

In view of the theory that dogs form the reservoir for human leishmaniasis and the paucity of records of canine infection in China, a survey was made of the canine population of an area west of Lanchow. One hundred and ten dogs, with clinical symptoms suggesting leishmaniasis, were examined by skin biopsy and ilium puncture, and 44 were found to be infected, the organism being demonstrated in 38 by skin biopsy and 39 by ilium puncture, 25 of the animals being from villages where kala-azar was endemic, and 19 from villages believed free. As the canine disease was well known in the Lanchow area, it is concluded that it has been endemic in North-West China for a considerable time. It has been generally held that kala-azar rarely occurs at altitudes above four thousand feet, but the altitude here varied from 5,656 to 7,788 feet, both kala-azar and sandflies being present.—U. F. Richardson.

Adler, S., & Tchernomoretz, I. (1946.) **Failure to cure natural canine visceral leishmaniasis.**—*Ann. trop. Med. Parasit.* **40.** 320–324. **440**

Details are given of the treatment of seven cases of visceral leishmaniasis with stilbamidine, two of the animals being also treated with neostibosan or urea stibamine. One animal made an apparent recovery, but as it still yielded positive reactions after the cessation of treatment, it is suggested that the cure was spontaneous. The other dogs remained infected and died, or were destroyed. It is concluded that after intensive treatment with stilbamidine there is a residual infection in the corneo-sclerotic junction, lymphatic glands and skin, the latter serving as a source of infection for other dogs and man.

Two infected bitches gave birth to healthy litters, the organs of three of the puppies failing to reveal organisms on P.M. examination.

—U. F. Richardson.

van Dyke, H. B., & Gellhorn, A. (1947.) **Chemotherapy of experimental leishmaniasis.**—*Proc. Soc. exp. Biol., N.Y.* **61.** 403–405. **441**

In tests on 30 antimonials and 158 metallic and non-metallic compounds no drug superior to stibanose [methylaminoethanol of sodium antimony gluconate], neostam [stibamine glucoside] or neostibosan [derivative of amino phenyl stibinic acid] was discovered.

The compounds were tested by the following method. One or more groups of 100 Syrian hamsters (*Cricetulus cuiratus*) about four weeks old were inoculated by an intraperitoneal injection of ground hamster spleen heavily parasitized with the Khartoum strain of *L. donovani* and equivalent to 20 mg. spleen. (*L. infantum* was unsuitable as also were intratesticular injections with several strains of Leishmania.) After four weeks there was usually a patent infection which was uniform for the group as judged by liver smears. Each group of 100 was sub-divided at random into groups of five. Of these sub-groups one served as untreated control, a second received the standard stibanose 500 mg. per kg. daily and the remaining 18 sub-groups received the other, not specifically stated, compounds. Solutions in water or suspensions in 2% gum acacia were injected intra-

peritoneally once daily for six days and a liver puncture made two days after the last injection. Results could easily be classified into :– no chemotherapeutic effect ; a chemotherapeutic effect less than that of stibanose and a chemotherapeutic effect equal to that of stibanose.

In a very few cases only was it necessary to carry out additional experiments to decide between the first two findings.—N. DEAN.

FREY, A. (1946.) Beitrag zur Pathogenese der Trichomoniasis des Rindes, speziell der Pyometra post conceptionem. **[The pathogenesis of trichomoniasis in cattle.]**—*Inaug. Diss., Zürich.* pp. 45. **442**

After discussing the geographical distribution, location in the body, methods of demonstrating infection, symptomatology and pathogenicity of bovine trichomoniasis, an account is given of the examination of all cases of pyometra encountered at the Zürich slaughter house over a period of six months, 38 cows being involved. Examination was carried out by microscopic examination, and by the inoculation of washings of the genital tract into serum-broth, serum-agar, Diernhofer's medium (pyometral fluid) liver-broth and nutrient agar. Bacterial contamination was checked by the inoculation of agar plates and liver-broth tubes.

A table is given showing the findings in respect of the vagina, uterus, fallopian tubes and ovaries. Foetal membrane material or macerated foetus was present in nine cases. In three cases *Corynebacterium pyogenes* was present, and trichomonads absent. In 35 cases trichomonads were present, detectable microscopically in 23 cases, but revealed only by culture in 12 cases. In 34 cases a *corpus luteum* was present, in two cases the ovaries were atrophied, and in two cases they were cystic. Attention is drawn to the common occurrence of calcification of the cotyledons, but in no case was this ascribable to tuberculosis. Well developed yellow bodies were present, but the ovarian follicles were small, the ovarian picture resembling that of animals before reaching maturity. In 20 healthy cows no trichomonad infection was detected.

An account is given of the course of trichomonad infection in an attempt to explain its various manifestations, from which it is concluded that treatment of pyometra should be directed to the restoration of tone by the use of follicular hormone or "metratonin", and surgical disinfection should be used only as a second line of treatment.—U. F. RICHARDSON.

CASSAMAGNAGHI, A., & CASSAMAGNAGHI, A. (hijo). (1944.) La trichomoniasis de los bovinos. Su reconocimiento en el ganado uruguayo. **[Bovine trichomoniasis.]**—*Ann. Fac. Vet., Montevideo.* **4.** 357–375. **443**

Trichomonas foetus was first found in Uruguay in 1942 during an investigation on brucellosis. It is now known to be fairly widespread. Affected cows may have vaginitis with muco-purulent discharge and will return to the bull repeatedly ; or they may conceive and abort at 2–4 months or carry a mummified foetus for full term. In bulls only slight symptoms, if any, are apparent. It is recommended that all known infected animals should be slaughtered and that no new animals be introduced to any herds. Breeding should be by artificial insemination with semen from clean bulls.—R. MACGREGOR.

SIPPEL, W. L., BASSHAM, H. A., & BENNETT, P. H. (1947.) **Successful treatment of trichomoniasis in two bulls.**—*J. Amer. vet. med. Ass.* **111.** 299–300. **444**

The successful treatment is recorded of two bulls with *Trichomonas* infection using the method advocated by Bartlett, *i.e.*, the intravenous use of sodium iodide, five injections being made at 48-hour intervals. Earlier treatment using acriflavine was not successful. The criterion of cure was the fact that these bulls served four virgin heifers without the heifers developing infection.

—W. R. KERR.

LAING, J. A., & DAY, F. T. (1947.) **Observations on the course and resolution of *Trichomonas foetus* infection in a group of heifers.**—*Vet. Rec.* **59.** 265–269. **445**

An account of observations on the course of the disease in a group of 26 Shorthorn virgin heifers which had been served by bulls infected with *Trichomonas foetus*. The heifers were separated from the bulls after three months when 15 were pregnant ; five aborted, ten carried their calves to full term and one was disposed of without examination. Monthly examinations were carried out *per vaginam* and *per rectum*. The non-pregnant heifers and two of those which aborted were artificially inseminated and conceived normally ; three were disposed of before pregnancy could be definitely diagnosed. Two months after the separation of the heifers from the bulls there was no evidence of infection, except in pregnant animals which aborted, and in these after abortion no infection was found. The disease appeared to resolve itself spontaneously. Animals which had calved or aborted following service by the infected bulls, or following artificial insemination, were served by an uninfected bull. All became pregnant and the bull at P.M. examination had no *T. foetus* infection.

The trichomonads appeared to be able to colonize in the uterus only while an active corpus luteum was present.—C. HORTON SMITH.

FRIEDHEIM, E. A. H., & BERMAN, R. L. (1947.) **Effect of BAL on trichomonacidal activity of some organic arsenicals.**—*Proc. Soc. exp. Biol., N.Y.* **65.** 180–182. **446**

The authors have shown that condensation of BAL with mapharsen to yield 2-amino-4 (methylolcyclo-(ethylenedimercaptoarsino))phenol results in a compound which if used in the form of its hydrochloride compares favourably with acetarsone, aldarsone [arsenic compounds] and bromacetic acid as a trichomonacide. Using *Trichomonas vaginalis* (obtained from fresh specimens of vaginal secretion from clinical cases) as test organism and determining the drug concentration necessary for flagellar immobilization in five minutes, mapharsan was active in a dilution of 1 : 100 whilst its BAL derivative was active at 1 : 600.

This increase in trichomonacidal activity is thought to be associated with the increase in lipophilic character of the molecule brought about by condensation with BAL.

Two new compounds, p-melaminylphenyl sodium arsonate and the antimony analogue were also examined; the arsenic derivative was inactive but the antimony compound was superior to acetarsone and aldarsone.—N. DEAN.

PIERCE, A. E. (1947.) **The serum agglutination reaction of *Trichomonas foetus*, Riedmuller, 1928.**—*Lab. J.* **8.** 238–244. **447**

P. gives an account of his use in 3,000 tests of the serum agglutination test developed by KERR & ROBERTSON [*V. B.* **12.** 408; **16.** 137 & **18.** 198]. Sera are prepared from rabbits by intravenous injection of live organisms or by intramuscular injection of freeze-dried organisms in liquid paraffin. Serum may also be obtained from cattle which have had a natural infection. Preservatives must not be added to the sera. Details are given of the methods used in growing the organisms in cultures, of the preparation of live suspensions, the making of dilutions and of the reading of the test. These methods differ widely from those used by bacteriologists. Photomicrographs illustrate the various types of agglutination reactions which occur. The test has not been widely adopted, probably because the technique differs so markedly from more orthodox serological techniques.—M. C.

DEVOLT, H. M., & HOLST, A. P. (1948.) **Preliminary report on the preventive action of vioform against infectious enterohepatitis (blackhead) of turkeys.**—*Poult. Sci.* **27.** 356–358. **448**

In experiments on the value of vioform (iodochloroxyquinoline) as a prophylactic against blackhead, 39 turkey poults varying in age from one to two months were fed on a mash to which 1% vioform had been added, for periods varying from 48 hours to one month prior to inoculation of blackhead cultures into the crop, whilst 28 poults fed on non-medicated mash were inoculated as controls. The death rate in the medicated groups was 15·3%, and in the controls 96·4%. In a field trial in a flock affected several days before the experiment started, 51 turkeys were fed medicated mash and 53 left as controls, the two groups being subjected to changes of yards, twice a week. 19·6% of the medicated birds died, and 45·2% of the controls.

It is hoped to carry out further experiments. Trials with sulphathiazole, sulphaguanidine and certain anti-malarial drugs have failed to indicate that they had any value against blackhead.

—U. F. RICHARDSON.

WATSON, J. M. (1946.) **The bionomics of coprophilic protozoa.**—*Biol. Rev.* **21.** 121–139. **449**

Coprozoic or coprophilic protozoa are capable of living and multiplying in faecal matter to which they may be introduced as cysts by air or water or by traversing the alimentary canal in the encysted state. They do not form a well-defined community as they also occur in a variety of other habitats. Certain forms, however, show a marked predilection for faecal matter and are better able than others to survive and multiply in diluted faeces. These forms have certain features in common and may be regarded as a loose ecological group. In 1907 WENYON clearly established the nature and independent status of the coprophilic forms; he attempted to cultivate both human and murine species of *Entamoeba*, but succeeded only in rearing free-living species which had passed through the intestine in an encysted condition and had then emerged to lead an active life in the voided faeces. The term "coprozoic" was coined by MINCHIN to describe those protozoa which as cysts were capable of passing passively through the intestine and subsequently hatching and giving rise to active forms in the moist dung. The definition has now been extended to include those forms which have a special predilection for living in faecal material but which reach the stool after its discharge without passing through the alimentary canal. It was not until 1927 that HOARE published the results of his experiments on the effects on ciliates of variation in the tonicity and hydrogen-ion concentration of the medium and of variation in temperature and dilution of faeces. Between the years 1940–46 WATSON dealt with the effect of variation of environmental factors in *Balantiophorus minutus* and *Glaucoma piriformis* and with the factors which limit their growth in certain types of stools. The conditions of life in an undiluted stool are specialized and

peculiar and the only protozoa capable of living and multiplying in undiluted faeces are those requiring an environment rich in high-molecular, decomposable, organic food material in which decomposition due to bacteria is going on actively and there is little or no dissolved oxygen (polysaprobic forms). The polysaprobic forms themselves may be unable to live under coprozoic conditions owing to their inability to move in a viscous medium. The viscous nature of the medium is one of the principal limiting factors in connexion with a coprozoic existence. All successful coprophilic protozoa have some adaptation to enable them to overcome this difficulty, *e.g.*, amoebae or amoeboid forms are suited to creeping through the limited fluid-containing spaces in the stool. Characteristic methods of locomotion among the coprophilic flagellates are to be seen in the gliding movements of *Copromonas subtilis* and *Helkesimastix faecicola*, the jerky small-scale darting movements of *Bodo caudatus* and *Proleptomonas faecicola*, and in the amoeboid phases of other flagellates as in *Cercomonas longicauda*. The coprophilic flagellates are also of small size. Ciliates, which are fast-swimming forms, are relatively infrequent coprophilic forms. Coprophilic protozoa fall into two groups based on the differences of their food and feeding habit, *i.e.*, holozoic forms like the amoebae, *Bodo caudatus*, *Cercomonas longicauda* and *Copromonas subtilis*, ciliates like *Lembus pusillus* and *Balantiophorus minutus* and, second, the saprozoic forms like *Proleptomonas faecicola* and *Helkesimastix faecicola*. The principal importance of coprophilic protozoa from the medical and veterinary standpoint lies with the possibility of confusing them with genuine parasitic forms and of attributing to them pathogenic effects. There are many erroneous descriptions and much confusion in the literature. Coprophilic species may be readily differentiated from parasitic ones, *e.g.*, if the freshly-passed stool is examined it is improbable that coprophilic forms will have had time to develop in it and any protozoa present may therefore be regarded as parasites. If the examination cannot be undertaken immediately a portion of the stool may be set aside and kept moist, while other portions are diluted with sterile water, inoculated into dilute nutrient media and streaked out on to agar plates. At room temperature any parasitic species will rapidly die out, while the coprophilic species will increase in numbers but will die out at 37°C. Many of the predominant forms in sewage are coprophilic species carried there as air-borne cysts or in drainage water. A close ecological relationship exists between the coprophilic and the soil protozoa from which they were derived. Many species of coprophilic protozoa are useful as indicator species and their presence in drinking water suggests faecal or sewage contamination. The coprophilic protozoa recapitulate the various steps by which free-living species may become adapted to the parasitic habit and it is concluded that they may themselves evolve into true parasites.—C. Horton Smith.

Baumann, R. (1947.) Untersuchungen über die Nuttalliose der Pferde in Griechenland. **[Babesia infection in horses in Greece.]**—*Wien. tierärztl. Mschr.* **34.** 499–506. **450**

It is pointed out that in many parts of Greece *Babesia* infection is enzootic, horses contracting infection as foals and acquiring premunity with little loss, whilst in imported horses the mortality may be serious. The parasites are described as occurring as rings, pear forms, rods and anaplasma bodies. In the pear forms the chromatin occurs at the side or at the blunt end, never at the pointed end. Multiplication is preceded by division of the chromatin into four, never into two. In one case division of the chromatin into five is recorded. The number of Maltese cross forms in smears is small. Staining with Manson's borax methylene blue is recommended as being less disturbed by decrease of pH than Giemsa staining.

Transmission is said never to occur in stables. The disease is most prevalent in bush country, and roads through forests are particularly dangerous as sources of infection.

Descriptions are given of the clinical signs and pathological anatomy, the most striking features being enlargement of the spleen and prominence of the splenic follicles. Histologically the condition resembles infectious anaemia in the deposition of iron in the spleen pulp and haemosiderin in the liver, and the round-celled infiltration of the capillaries of these organs.—U. F. R.

See also absts. **432** (bartonellosis); **493** (coccidiosis); **605** (veterinary protozoology: a textbook).

DISEASES CAUSED BY VIRUSES AND RICKETTSIA

Araújo, J. S. (1946.) Identificação do virus aftoso. **[Complement fixation tests in foot and mouth disease.]**—*Rev. Med. vet., Lisboa.* **41.** 317–328. [English and French summaries.] **451**

A description of complement-fixation technique which deviates little from the standard methods using complete haemolysis as end-point. The author lays especial emphasis on the titration of all reagents, including the antigen and immune serum.—J. B. Brooksby.

ARAMBURU, H. G. (1947.) La prueba de fijacion del complemento para tipificacion del virus aftoso. (Comunicación preliminar). [**The complement fixation test in the typing of foot and mouth disease virus.**]—*Rev. Med. vet., B. Aires.* **29.** 793–801. **452**

The author's technique follows closely that of TRAUB & MOHLMANN [*V. B.* **14.** 231]. The preliminary titration of complement is carried out in the presence of the antigen, a 1 : 10 suspension of bovine epithelium. The dose of complement used in the test is 1·5 minimum complementary dose. The antisera are obtained from groups of g. pigs recovered from the infection, and sometimes from hyperimmunized g. pigs. The test may be carried out in the incubator or in a water-bath at 37°C. The sensitized cell suspension, containing the unusually small amount of 1 minimum haemolytic dose of haemolytic amboceptor in each dose, is added after 15–20 min. incubation, and the final reading of the test made 30 min. later.

Of 51 bovine field strains, sent to the laboratory without especial precaution as regards temperature, 22 were of type O, ten of type A, four of type C, six were atypical and in only nine cases was no result obtained.—J. B. BROOKSBY.

LEVADITI, C., PÉRAULT, R., & SERGENT, C. (1944.) Effets des inoculation de la souche neurotrope du virus aphteux dans la membrane chorio-allantoïde de l'oeuf incubé de poule. [**Inoculation of the chorio-allantoic membrane of the developing hen's egg with a neurotropic strain of foot and mouth disease virus.**]—*C.R. Soc. Biol. Paris.* **138.** 139–140. **453**

Hen's eggs, incubated for 7–12 days, were inoculated by the chorio-allantoic membrane route with NAGEL & HOFMANN'S [see *V. B.* **12.** 579] mouse-adapted neurotropic strain of foot and mouth disease virus. Histological changes were revealed in certain first passage membranes which, in the authors' opinion, resembled those produced in the g. pig pad by a dermatropic strain. No virus was recovered from these membranes, however, either by intracerebral inoculation of mice or by intradermal inoculation of g. pigs.—W. M. H.

ARAMBURU, H. G. (1944.) Determinación de la presencia del virus aftoso en el liquido amniótico de cobaya. [**Determination of the presence of foot and mouth disease virus in guinea pig amniotic fluid.**]—*Rev. Med. vet., B. Aires.* **26.** 337–340. [Also appeared in *Bol. tec. Direcc. gen. Agric. Ganad., B. Aires.* Secc. ganad. No. 10. pp. 688–691. (1944).] **454**

The amniotic fluid of pregnant g. pigs was found to be infective 24, 48 and 72 hours after they had been inoculated on the plantar pads with foot and mouth disease virus.—W. M. HENDERSON.

ANON. (1948.) **Status of foot-and-mouth disease vaccination.**—*Vet. Med.* **43.** 401–402. **455**

Contains no new information. The author (anonymous) apparently seeks to discredit the official policy adopted in connexion with attempts at controlling foot and mouth disease in Mexico.
—W. M. HENDERSON.

KAISER, M, & ZEISEL, R. (1939.) Über die Kuhpocken und ihre Verbreitung in der Ostmark. [**Cow pox infections and their spread in Austria.**]—*Wien. tierärztl. Mschr.* **26.** 561–575. **456**

Cow-pox was common among cattle in Austria, its frequency decreasing from East to West. There were no cases of human smallpox between 1926 and 1939. Besides true vaccinal exanthemata on the cow's udder non-vaccinal rashes may occur, which are little understood. These diseases may give rise to an infection in human beings, known as milker's nodule.
—W. R. BETT.

FAZEKAS DE ST. GROTH, S. (1948.) **Viropexis, the mechanism of influenza virus infection.** [**Correspondence.**]—*Nature, Lond.* **162.** 294–295. **457**

The results of experiments with active and heat-killed (30 min. 56°C.) Lee influenza virus introduced into the allantoic cavity of normal, formolized and periodate-treated eggs showed that both active and heat-killed viruses disappear from an allantoic cavity with living cellular lining, irrespective of whether the receptors are normal or modified by periodate. In cavities in which the living cells have been killed by formaldehyde all the virus can be recovered. FAZEKAS DE ST. GROTH & GRAHAM have already concluded that periodate modification of cell receptors does not allow of any enzymatic action of the virus on the receptor substance. The author considers, therefore, that penetration of the cell membrane by the virus does not depend on the viability or enzymatic activity of the infective particle, but only on the functional integrity of the host cell. Disagreement is expressed with HIRST'S "enzyme-substrate combination hypothesis" [*V. B.* **13.** 318 and the following abst.]. The author suggests instead that specific adsorptive combination between cellular "receptor area" and the viral "combining area" is followed by the ingestion of the infective particle. As this sequence appears similar to the uptake by cells of colloidal dyes the term "viropexis" is proposed for its description, *cf.* colloidopexis.—W. M. HENDERSON.

I. HIRST, G. K. (1948.) **The nature of the virus receptors of red cells. I. Evidence on the chemical nature of the virus receptors of red cells and of the existence of a closely analogous**

substance in normal serum.—*J. exp. Med.* **87.** 301–314. [Summary copied *verbatim.*] **458**

II. HIRST, G. K. (1948.) **The nature of the virus receptors of red cells. II. The effect of partial heat inactivation of influenza virus on the destruction of red cell receptors and the use of inactivated virus in the measurement of serum inhibitor.**—*Ibid.* 315–328. [Summary copied *verbatim.*] **459**

I. The influenza virus receptors of fowl red cells and the influenza virus inhibitor of normal rabbit serum have the following attributes in common. They are stable at high temperatures and in solutions of pH as high as 10·0. They both resist destruction by a number of oxidizing agents but are readily destroyed by sodium periodate, trypsin, and influenza virus. These facts suggest that the red cell receptor and the normal serum inhibitor are either the same or analogous substances and that they may belong to the mucoprotein class of compounds.

II. Evidence has been offered that influenza virus which has been heated at 56°C. for 30 or more minutes loses some of its capacity to agglutinate red cells and may completely lose its power to elute from cells on which it has been absorbed. Such heat-inactivated virus does not possess the capacity to destroy the virus inhibitor in normal rabbit serum and this appears to be the explanation of the higher agglutinin inhibitory levels obtained with serum and heated virus as compared with serum and untreated virus.

The heat-inactivated virus can be used to measure the inhibitor substance in normal rabbit serum. By two different methods it has been demonstrated that the inhibitor is destroyed in the presence of unheated influenza virus, as measured by inhibition titrations with virus inactivated at 56°C. The destruction of inhibitor by virus of either type A or B can be measured by virus of either type with similar results.

HARDY, P. H., Jr., & HORSFALL, F. L., Jr. (1948.) **Reactions between influenza virus and a component of allantoic fluid.**—*J. exp. Med.* **88.** 463–484. [Summary copied *verbatim.*] **460**

Evidence is presented which shows that there is a component present in normal allantoic fluid, probably mucoprotein in nature, capable of combining with influenza A virus (PR8), and that following combination between this component and the virus only partial dissociation of the complex occurs. Evidence is also presented which strongly suggests that the component is present in virus-infected allantoic fluid in which it is in part combined with the virus and in part free although altered by viral action. The probability that the component is present as well in highly purified preparations of influenza virus, and its effect upon various reactions obtained with this agent are discussed.

FRIEDEWALD, W. F., & HOOK, E. W. (1948.) **Influenza virus infection in the hamster. A study of inapparent virus infection and virus adaptation.**—*J. exp. Med.* **88.** 343–353. [Summary copied *verbatim.*] **461**

A study of influenza virus infection in the hamster has yielded the following results :– Two influenza A strains (Ga. 47 and PR8) multiplied readily in the hamster lung, although no lung lesions were produced during six serial passages. On further passage both viruses abruptly acquired the capacity to produce pulmonary consolidation and death of the animals. Extracts of the lungs during the early passages contained complement-fixing antigen and infectious virus, as revealed by titration in mice and embryonated eggs. Agglutinins for chicken, human, and guinea pig red cells, however, were not demonstrable at this time. With further passage a close correlation was observed between the capacity of the virus to produce lung lesions in the hamster and to agglutinate mammalian types of red cells. In addition, quantitative changes in the virus population were demonstrated in the lung extracts by complement fixation tests and titrations in mice and eggs. Incubation at 37°C. was effective in bringing out agglutinins in high titer for chicken red cells in lung extracts, which originally failed to agglutinate chicken cells but agglutinated mammalian red cells. This method did not increase the titers of mammalian cell agglutinins. The body temperature of the hamster was found to decrease within 1 to 4 days after inoculation of influenza virus. In the early passages the temperature returned to normal within 24 hours, but with the development of the pathogenic strain of virus the temperature remained at subnormal levels until death. The Lee strain of influenza B virus produced pulmonary lesions in the hamster on the first passage and no increase in pathogenicity of the virus occurred during eleven serial passages. Virus was demonstrable in extracts of the lungs by all the methods used and no difference was observed in its capacity to agglutinate fowl and mammalian types of red cells.

The implications of these findings are considered briefly in the discussion.

LESTER, W. (1948.) **The influence of relative humidity on the infectivity of air-borne influenza A virus (PR8 strain).**—*J. exp. Med.* **88.** 361–368. [Summary copied *verbatim.*] **462**

White mice were exposed to atmospheres containing known amounts of atomized influenza A virus (PR8 strain) of constant potency under

conditions of varying humidity. It was found that an amount of atomized virus suspension which produced a 100 per cent mortality rate in animals exposed at 30 and 80 per cent relative humidity, respectively, resulted in the death of only 22·5 per cent of mice at a humidity of 50 per cent. The humidities between these values gave intermediate results.

The infectivity of the air-borne virus decreased so rapidly at a humidity of 50 per cent that it was impossible to secure a 100 per cent mortality rate in the exposed mice even by greatly increasing the dose of virus atomized.

The use of a dialyzed virus suspension at a humidity of 50 per cent resulted in the death of all exposed mice. This suggested that the deleterious influence of humidity was related to the presence of sodium chloride in the atomized suspension.

These findings with influenza virus closely resembled those obtained by DUNKLIN & PUCK [*V. B.* **18.** 405] with pneumococci, streptococci, and staphylococci which would suggest that the factor responsible for the lethal effect of humidity is common to moist particles containing either the above-mentioned bacteria or influenza A virus.

LANNI, F., & BEARD, J. W. (1948.) **Inhibition by egg-white of hemagglutination by swine influenza virus.**—*Proc. Soc. exp. Biol., N.Y.* **68.** 312–313. **463**

Egg white was found to be approximately 200 times as effective as normal rabbit serum in inhibiting haemagglutination caused by heated swine influenza virus. Haemagglutination caused by aged formolized vaccine was also susceptible to inhibition by egg white. Unheated virus required 750–1,000 times as much egg white for similar inhibition. The inhibitory substance in egg white was inactivated by dilute potassium periodate.

Undiluted egg white gave an interfacial precipitation reaction with concentrated virus suspension. The precipitating capacity of egg white was destroyed by treatment with dilute potassium periodate.—F. D. ASPLIN.

BRIODY, B. A. (1948.) **Hemolysis of human red cells by saponin following viral action.**—*Science.* **107.** 450–451. **464**

Human red cells whose virus receptors were removed by treatment with swine influenza virus or *Vibrio cholerae* filtrates were more resistant to haemolysis with saponin than cells whose receptors were intact or coated by virus.—F. D. ASPLIN.

KABAT, E. A., WOLF, A., & BEZER, A. E. (1948.) **Studies on acute disseminated encephalomyelitis produced experimentally in rhesus monkeys. III.**—*J. exp. Med.* **88.** 417–426. [Summary copied *verbatim*. For previous parts, see *V. B.* **18.** 301.] **465**

The factor in brain tissue which induces acute disseminated encephalomyelitis, when injected into *rhesus* monkeys as an emulsion with adjuvants, has been found in human, monkey, rabbit, and chicken brain but is absent from frog and fish brain. It is unaffected by fixation of the brain in formalin, by boiling, and by treatment with ultrasound. It is present in the spinal cord of 3 day old rabbits but does not appear in the rabbit cerebrum until about the 12th day of life; in this respect it parallels the laying down of myelin. Attempts to produce the encephalomyelitis passively with large quantities of serum or of cell exudates, and suspensions of cells from spleen and lymph node from monkeys with encephalomyelitis, were unsuccessful.

PHILIPPE, J. (1941.) Les substances adjuvantes dans la vaccination contre la peste bovine. **[Adjuvant substances in vaccines against rinderpest.]**—*Bull. Serv. zootech. Epiz. A.O.F.* **4.** 15–21. **466**

P. refers to PRUNIER'S [*V. B.* **2.** 550] and CURASSON'S [*V. B.* **2.** 551] attempts to reduce the immunizing dose of formolized rinderpest vaccine by adding castor oil and tapioca. He mentions briefly an experiment of his own in which he replaced saline by a solution containing 2% agar and 3% alum. The immunizing power of this vaccine was no greater than that of a vaccine prepared from another portion of the same pulp suspended in saline.

A mixture of two parts of finely-minced pulp, five parts of lanoline and ten parts of cod-liver oil became avirulent in three days at room temperature and immunized at one-third of the dose of formolized vaccine; but the mixture was difficult to administer. By using dried vaccine suspended in oil an immunity of longer duration was evoked than that following the injection of a liquid vaccine. None of these vaccines, however, has any great practical advantage over formolized vaccine and the complications that arise in their manufacture render them unsuitable for field production, often the most satisfactory method of attacking outbreaks in large herds in a country where communications are difficult.

P. devised a vaccine using aluminium hydroxide as an adjuvant [see also JACOTOT (1940)], which in laboratory tests showed great promise.

In his first experiment he added 10% of an aluminium hydroxide suspension to half of a batch of Curasson's vaccine (one part pulp to three parts of 4% formol solution) that had been kept for three months in the ice-chest. Three calves were inoculated with vaccine in doses of 1, 2 and 5 ml.

respectively immediately after adding the suspension, three calves with the same doses after the mixture had stood for two days in the ice-chest and four calves with untreated vaccine in doses of 10, 20, 20 and 30 ml. On test with virus 12 days later all the calves reacted and recovered. The only severe reactor was the animal that received 2 ml. vaccine immediately after the addition of the suspension.

In the second experiment pulp was treated with one and a half parts of 8% formol and after 48 hours the mixture was filtered to remove tissue particles. To the filtrate was added 10% of aluminium hydroxide suspension and the vaccine was then dispensed in ampoules. Some of these were sent from Bamako to Ségou by post without special packing. Tests were made at both centres. Seven animals were vaccinated with doses ranging from 0·5–2·0 ml. The result of the testing of one animal is omitted from the table; but the others all reacted and recovered. [In neither of these experiments are any unvaccinated controls mentioned.]

P. supposes that the results are due to the slow elution of immunizing substances at the site of inoculation.—J. RICHARD HUDSON.

PHILIPPE, J. (1941.) Le plasma antipestique. Préparation et utilisation. **[Rinderpest hyperimmune plasma.]**—*Bull. Serv. zootech. Epiz. A.O.F.* **4.** 10–14. **467**

In view of the practical difficulties encountered in the preparation of rinderpest hyperimmune serum in hot countries, P. tested the practicability of replacing serum by plasma.

Hyperimmunized donors were bled into large glass bottles containing a solution of sodium citrate making a final concentration of 5%. Cells were separated by an Alfa-Laval corpuscle separator, type A9. The plates run at 6,000 r.p.m. and according to the setting of the machine the plasma yield varies from 50–75%.

Whilst starting up, the bowl is filled with physiological saline and the flow of blood is started when the correct speed is reached. Two siphons feed the blood from containers placed above the machine through a Y-piece to a jet which is fixed by a bung in the neck of a bell-jar. The bell-jar covers the bowl, the whole apparatus being simple and easily sterilized. When the blood starts to run in, the saline is ejected through the lower, corpuscle outlet. The plasma from the upper outlet is collected in a bottle from which it can be dispensed into sterile containers from below the froth.

10 ml. of 10% aqueous chinosol solution is added to each litre of plasma and, in order to prevent subsequent separation of fibrin, the plasma is stabilized by the addition of 10 ml. of 15% NaOH.

A comparative test of serum and plasma from a batch of 30 serum producers showed that, although a yield of 20–30% more plasma was obtained, the titre was lower. A dose of 50 ml. of plasma per 100 kg. was necessary as against 40 ml. of serum in order to obtain satisfactory reactions in immunizing cattle by the serum-simultaneous method. [The number of cattle used in the test was small.]—J. RICHARD HUDSON.

GARGADENNEC, L., & LALANNE, A. (1942.) La peste des petits ruminants. **[An undiagnosed transmissible disease of goats and sheep.]**—*Bull. Serv. zootech. Epiz. A.O.F.* **5.** 16–21. **468**

A disease of goats and sheep is described in the Ivory Coast territory, characterized by inflammation of the buccal mucous membrane, with formation of ulcers on the tongue and gums, a serous or muco-purulent discharge from the nose and profuse diarrhoea. The only other lesions observed were slight congestion of the small intestine and lungs. The disease is more severe in goats than in sheep. Inoculation of blood from an affected animal caused a symptomless febrile reaction in a calf on the sixth day, fever and inflammation of the mouth in a lamb after an incubation period of five days, and typical severe symptoms in goats.

Differentiation of the disease from heartwater, bluetongue and rinderpest is discussed, it being claimed that the inoculated calf later reacted to rinderpest inoculation. Treatment with novarsenobenzol (neoarsphenamine), given intravenously in doses of 5–10 ml. of a 1% solution gave good results, two doses on consecutive days being usually required. Blood from an animal that has recovered can be used protectively for animals exposed to infection, and both antiserum-virulent blood inoculation and a formolized spleen vaccine proved effective for immunization.—U. F. R.

CURASSON, M. G. (1941.) La rickettsiose generale ovine au Senégal. (Première note.) (La maladie expérimentale.) **[Rickettsia infections of sheep in Senegal.]**—*Bull. Serv. zootech. Epiz. A.O.F.* **4.** 34–36. **469**

CURASSON, G. (1942.) La rickettsiose ovine au Senégal. **[Rickettsia infections of sheep in Senegal.]**—*Bull. Serv. zootech. Epiz. A.O.F.* **5.** 3–8. **470**

In 1940, W. Africa experienced an outbreak of heartwater in sheep, introduced by some half-bred Astrakhan sheep imported into Senegal from Mauritius. Of five experimental sheep inoculated, hree developed high temperatures and abundant parasites (*Rickettsia ruminantium*) were present at the 18–25th day, but the animals survived. The other two died on the 13th and 20th days after periods of fever during which parasites were

demonstrated. The incubation period is nine days and is followed by fever which may end fatally; recovered animals are immune and act as reservoirs of the organism. The P.M. findings are hydropericardium, hydrothorax and ascites with haemorrhages on the endocardium and epicardium, congestion and oedema of the lungs, enlarged spleen and pulpy kidneys.

R. ovina has been found in some local sheep which are apparently immune and reservoirs. Of 13 Astrakhan × Moorish sheep imported 11 died in two months with symptoms similar to those caused by *R. ruminantium*; but as a rule the onset was more rapid. Incubation was from six to eight days and the final fatal symptoms appeared in less than 12 hours. No *R. ruminantium* were found, but 2–5% of the monocytes were invaded with *R. ovina*. The disease was transmitted experimentally by inoculation. In nature it is transmitted by *Boophilus decoloratus* and *Hyalomma aegyptium*.—R. MACGREGOR.

HUTCHINGS, L. M. (1947.) **Gastroenteritis in young pigs.**—*Vet. Med.* **42.** 297–298. **471**

The condition, a highly fatal type of gastroenteritis in young pigs a few days old, with a duration of illness of 45–72 hours, was first seen on a farm in Indiana in 1943. There was a marked diarrhoea and the faeces were almost white in colour and appeared to be unaltered milk. The conditions of management and sanitation on the farm were above average. Attempts to control the disease by disinfection and isolation all failed. It could be transmitted by ingestion and by inoculation [route not stated] of faeces both unfiltered and filtered.

Pigs that became infected when more than ten days old recovered, but remained stunted. Suckling sows sometimes had a tendency to diarrhoea and vomiting, but recovered in about four days.

The infective agent was able to withstand freezing for 13 months, but under natural conditions it did not appear to survive on the premises from one season to the next.

The disease appears to be on the increase and heavy losses have been reported from Iowa.

—D. LUKE.

BODINGBAUER, J. (1946.) Die Staupe-Schmelzhypoplasien (Staupegebiss des Hundes) als Fehlerquelle in der experimentellen Kariesforschung. **[Hypoplasia of the enamel caused by distemper, a possible source of error in studies of caries.]**—*Z. Stomatol.* **43.** 293–309. **472**

Previous experiments carried out by YAMAKAMI (1933 & 1935) and by HARNDT (1937, 1941 & 1942) on the feeding of dogs with sugar in order to provoke caries are critically discussed, and it is shown that the tooth anomalies described by these authors are in fact hypoplasia of the enamel caused by distemper and not caries defects.

This is proved on the basis of results obtained in clinical and histo-pathological examinations of teeth belonging to dogs who had been ill with distemper in the pre-dentition period and of dental pulp of unweaned whelps whose dams were infected with distemper.—J. JONAS.

SILVA, M., Jr. (1940.) Mal epizoótco do gato doméstico no Ceará. **[Epizootic of domestic cats in Ceará.]**—*Hosp., Rio de J.* **18.** 1015–1018. **473**

An outbreak of fatal gastro-enteritis of cats occurred in 1940 in Ceara, Brazil, concurrently with an epidemic of plague (*Past. pestis* infection) in human beings, accompanied as is usual by rat infection. Outbreaks at Jardim and at Crato occurred in the same circumstances.

At first the cat disease was considered to be related to the plague, but S. found that it was caused by a virus. The disease resembled that described by URBAIN [(1933) *Ann. Inst. Past.* **51.** 202], this being probably the same as the feline distemper shown by HINDLE & FINDLAY (1932) to be caused by a filtrable virus.

A young cat infected orally and intranasally with material from visceral and pulmonary lesions became ill after 48 hours, and died on the sixth day. Four cats infected in a similar way with similar material died between the 8th and 16th day.

As a result of the diminution in the cat population after an outbreak of feline gastroenteritis, the rat population increases and paves the way for the development of plague.

Two cats were infected from cats as in the above experiments and were turned loose in Crato to ascertain if an epidemic would develop. No deaths were reported in cats in the neighbourhood, but S. suggests that the local cats may have acquired immunity as a result of the earlier exposure.—F. E. W.

I. CHEEVER, F. S., & MUELLER, J. H. (1948.) **Epidemic diarrheal disease of suckling mice. III. The effect of strain, litter, and season upon the incidence of the disease.**—*J. exp. Med.* **88.** 309–316. [Discussion copied *verbatim*. For previous parts, see *V. B.* **18.** 464.] **474**

II. PAPPENHEIMER, A. M., & CHEEVER, F. S. (1948.) **Epidemic diarrheal disease of suckling mice. IV. Cytoplasmic inclusion bodies in intestinal epithelium in relation to the disease.** —*Ibid.* 317–324. [Conclusions copied *verbatim*.] **475**

I. Our investigations have clearly confirmed the report that suckling mice belonging to the

colony of the C3H strain were highly susceptible to diarrheal disease. The stock was freed of detectable infection by the delivery of the young by Caesarian section at term, and the subsequent nursing of these animals by presumably disease-free females belonging to another strain under conditions of rigid isolation. This colony is increasing slowly in size and has remained free of disease for nearly a year.

Among the four strains of mice that were observed during the course of a year significant differences were limited to the CFW strain. A lower percentage of these mice were weaned fairly consistently in comparison to the others. The three more resistant strains failed to show consistent or significant differences in the percentage of mice weaned.

The effect of litter was definite and consistent. For all four strains followed throughout the course of a year first litters fared worse than second and third ones while fourth and fifth litters showed the highest percentage of mice weaned. A possible explanation for this finding is that the breeding females may develop some degree of active immunity against the disease as a result of sustained contact with it, and that this immunity may be passed on in some degree to the young either *in utero* across the placental barrier or by the milk or colostrum. This passively acquired immunity may persist long enough to give some protection to the weanling mice during the first 3 weeks of life. Further evidence suggesting that this does occur has been reported. If this hypothesis is correct artificially induced active immunization of females prior to pregnancy may be of assistance in controlling the disease in the mouse colony.

The effect of season seemed clear cut only in the case of one strain (CFW); the highest percentage of mice weaned were observed during the summer months, and the lowest during the autumn and early winter. No consistent pattern was noted among the other strains. Further work along these lines is necessary before the relative importance of season as it affects the incidence of the disease can be properly assessed.

The question of the relationship of the present disease to that seen in our original stock during the period 1944–46 remains unsettled. Although the obvious manifestations were similar in both outbreaks the finding of intranuclear inclusion bodies in one as opposed to cytoplasmic ones in the other suggests that the diarrheal syndrome may be caused by more than one viral agent. This point is taken up in greater detail in a following paper which deals with the occurrence of the cytoplasmic inclusion bodies.

II. Cytoplasmic inclusions were found in the epithelial cells of the small intestine in a major proportion of suckling mice suffering from the spontaneous or experimentally produced diarrheal disease now prevalent in this laboratory. They were not found in healthy stock mice of corresponding age. Feeding of intestinal extract from healthy mice did not produce diarrhea or inclusions. Feeding of boiled extract from diarrheal mice did not lead to the formation of cytoplasmic inclusions, when precautions were taken to prevent accidental infection. The inclusions were regularly present only in the first few days of the disease. The inclusion-bearing cells desquamated. There was no inflammatory reaction.

Attention is called to the frequent presence of large numbers of Grampositive coccoid bodies in the intestinal contents of suckling mice with diarrhea.

Reagan, R. L., Lillie, M. G., Hauser, J. E., & Brueckner, A. L. (1948.) **Immunological studies of Newcastle virus.**—*Proc. Soc. exp. Biol., N.Y.* **67.** 234–236. **476**

Live Newcastle disease virus of the 82nd passage in Syrian hamsters was used to immunize chickens six weeks old. When they were subsequently subjected to challenge with three different strains of virus, 84·0–98·6% remained well. The viruses used to test immunity induced symptoms in only 22·5–57·5% of normal chickens.

—F. D. Asplin.

DeLay, P. D., DeOme, K. B., & Bankowski, R. A. (1948.) **Recovery of pneumoencephalitis (Newcastle) virus from the air of poultry houses containing infected birds.**—*Science.* **107.** 474–475. **477**

Newcastle disease virus was demonstrated in samples of air collected from a house containing 280 chickens in which symptoms had first appeared seven days earlier, and from a second house containing 335 birds in which evidence of disease had first appeared ten days earlier.

In four chickens confined in a cage suspended four and a half feet above the floor of a house containing infected chickens symptoms developed after seven days.—F. D. Asplin.

Buck, G. (1947.) Note sur une maladie des volailles tout nouvellement observée à Madagascar. **[A disease of fowls recently observed in Madagascar (Newcastle disease).]**—*Bull. Soc. Path. exot.* **40.** 376–382. **478**

A disease of fowls appeared at Tamatave in August, 1945 and spread along the main traffic routes. Symptoms, lesions and epidemiology indicated that this condition was Newcastle disease. Hygienic control measures are discussed.

—F. D. Asplin.

REAGAN, R. L., LILLIE, M. G., HAUSER, J. E., & BRUECKNER, A. L. (1948.) **Response of the Syrian hamster to the virus of Newcastle disease.**—*Proc. Soc. exp. Biol., N.Y.* **68.** 293–294. **479**

A Californian strain of Newcastle disease virus was passaged more than 200 times in the brains of Syrian hamsters. The virus produced symptoms of irritability, inco-ordination and paralysis. The incubation period decreased from 2–4 days in the early passages to 12 hours after the 190th passage.

The infective titre of hamster brain suspension for hamsters did not rise significantly between the 49th and 200th passage. Hamster adapted virus did not induce symptoms in hamsters when injected subcutaneously, intramuscularly, intraperitoneally or intradermally; virus of the 92nd hamster passage was non-pathogenic for chickens 3–6 weeks old.—F. D. ASPLIN.

SCHMITTLE, S. C., & MILLEN, T. W. (1948.) **Detection of hemagglutination-inhibition antibodies in unincubated eggs.**—*Cornell Vet.* **38.** 306–309. **480**

Newcastle disease antibody was detected in egg yolk of immune hens by the following procedure.

Yolk (1·5 ml.) was diluted with normal saline (6·0 ml.) and extracted with ethylene dichloride (2·0 ml.) and ether (1·0 ml.). The mixture was shaken and incubated at 37°C. for 12 hours. The supernatant aqueous extract was then substituted for serum in an H.I. test.—F. D. ASPLIN.

HOFSTAD, M. S. (1947.) **A study of infectious bronchitis in chickens. IV. Further observations on the carrier status of chickens recovered from infectious bronchitis.**—*Cornell Vet.* **37.** 29–34. [For previous parts, see *V. B.* **16.** 11, & **18.** 499.] **481**

Chickens recovered from infectious bronchitis contracted as baby chicks were tested for infectivity. In one trial 21 chickens were still infective 20 days, but non-infective 80 days, after recovery. In other trials similar chickens were infective 28–35 days after recovery, but non-infective 94 days after recovery.—F. D. ASPLIN.

ASPLIN, F. D. (1948.) **Identification of infectious bronchitis of chickens in England.**—*Vet. Rec.* **60.** 485–486. **482**

In tracing the spread of Newcastle disease by fowls sold by dealers it was found that while some of the birds developed typical Newcastle disease, others developed a disease described as mild "colds". Sera from birds convalescent or recovered from "colds" did not inhibit agglutination of red cells by Newcastle disease virus. The disease was readily transmitted by nasal or tracheal instillation of nasal exudate from infected birds and by contact. Symptoms consisted of sneezing, watery nasal discharge, gurgling and rattling respiratory sounds especially at night, lachrymation and facial swelling being observed in some cases. The tracheal mucosa was oedematous, as were the air-sac membranes. In chronic cases the air-sacs were distended with caseous casts.

Three separate strains were studied and were found to be immunologically identical. One strain isolated by filtration of nasal and tracheal discharge through a 0·5 u A.P.D. gradocol membrane was passaged in chicks for 36 passages involving 251 chicks, all of which developed symptoms but only six died. Immunity after recovery persisted for at least six months. The period of incubation was 1–5 days and the duration of illness 2–12 days. Recovered chicks had no immunity to infectious laryngotracheitis, to fowl pox nor to Newcastle disease and *vice versa.*

A strain of infectious bronchitis virus was obtained from Hoftstad of Iowa State College which, when inoculated into chicks, produced a disease identical symptomatically with the disease under investigation and cross immunity tests showed the two viruses to be immunologically identical. The author concluded that the virus isolated from the English chickens was infectious bronchitis virus. The literature is briefly reviewed. This appears to be the first occasion on which infectious bronchitis has been recognized in fowls in England.—M. C.

PRIER, J. E., SUTHERLAND, A. K., & BEAMER, P. D. (1948.) **Preliminary studies on a respiratory disease in turkeys.**—*Cornell Vet.* **38.** 208–212. **483**

A respiratory disease was observed in two turkey breeding flocks. Symptoms included gasping, dyspnoea and cyanosis. Lesions were confined to the respiratory tract and consisted of mucoid tracheitis and inflammation of the air sac membranes, sometimes with caseous accumulations.

The disease was transferred to turkey poults and was passaged serially through chicks. The agent was filtrable and was propagated in hens' eggs without causing death of the embryo.

The disease was differentiated from Newcastle disease but not from infectious bronchitis.

—F. D. ASPLIN.

LENSEN, S. G., RHIAN, M., & STEBBINS, M. R. (1947.) **Inactivation of partially purified poliomyelitis virus in water by chlorination. II.**—*Amer. J. publ. Hlth.* **37.** 869–874. [Summary copied *verbatim.*] **484**

The inactivation of partially purified poliomyelitis virus (mouse adapted Lansing strain) in

water by chlorination has been studied at two different pH ranges. It was found that, at the pH range from 6·85 to 7·4, the virus was inactivated after a contact period of 10 minutes in all samples with residuals consisting of free chlorine and chloramine (even with as little as 0·05 p.p.m. free chlorine). At a higher pH range (pH 8·95–9·25), the outcome of the experiments with such mixed residuals suggests a decrease of the virucidal action of chlorine with the increasing pH: in some of these experiments the virus was not inactivated after 30 minutes or 1 hour in spite of the presence of residual free chlorine. In samples with residual chloramine and no free chlorine, no significant difference in the virucidal action was found depending on the pH. In spite of a certain inconsistency, the results of these experiments indicate that residual chloramine values of 0·5–0·75 p.p.m. usually inactivate the virus in less than 2 hours, while residual chloramine values of 0·2 p.p.m. or less fail to inactivate the virus.

See also absts. **434** (bacterial warfare); **535** (fowl paralysis); **587** (swine fever); **603** (fowl leucosis).

IMMUNITY

RICE, C. E. (1947.) **A study of the reliability of complement fixation as a method of measuring the activities of sera of high, medium and low antibody titer.**—*J. Immunol.* **55.** 1–13. **485**

This paper is one of a series on the quantitative principles of complement fixation. Purified pneumococcal antigen and the homologous antiserum (rabbit) were used and the relations between combining activity, precipitative antibody, nitrogen content and complement fixation were studied. The data on sera of high, medium and low titre were treated in the ways discussed in earlier papers of the series, and the method of expression of serum titre finally chosen gives very good agreement between the complement fixation results and the others. The application of corrections for the effects of the reagents on complement (anticomplementary and enhancing effects) is discussed and it is concluded that no final opinion on this aspect can yet be given.—J. B. BROOKSBY.

ANON. (1946.) **Hemagglutination by amniotic fluid from normal embryonated hen's eggs.**—*Proc. Soc. exp. Biol., N.Y.* **62.** 118–123. **486**

A haemagglutinin was demonstrated in the amniotic fluid of embryos, 11–13 days old. Erythrocytes of 13 out of 18 species tested were agglutinated. Mouse, rabbit and g. pig cells were susceptible; fowl cells were not. The haemagglutinin was heat labile and was associated with the globulin fraction of egg white. It gained access to the amniotic fluid after the rupture of the albumen sac. The haemagglutinin was absorbed by mouse but not by fowl cells. It was not demonstrated in the allantoic fluid or the serum of normal 17-day-old embryos.—F. D. ASPLIN.

SHERWOOD, N. P., STOLAND, O. O., KIRK, J. S., & TENNENBERG, D. J. (1948.) **Anaphylaxis XVIII: studies on passive sensitization of the dog.**—*J. Immunol.* **59.** 279–284. **487**

A great deal of literature has been concerned with the many aspects of the transference of hypersensitivity to the normal animal, particularly the dog. Agreement has not been reached upon all the facts of this phenomenon and the question of a latent period has been the subject of considerable controversy. In their study of this aspect the authors showed that a latent period is unnecessary. They also showed that by using their technique and in the absence of a latent period the minimum sensitizing dose can be ascertained.

An interesting point arises from their results, a normal dog completely atropinized was not protected from anaphylactoid shock.—W. R. KERR.

RAFFEL, S. (1948.) **The components of the tubercle bacillus responsible for the delayed type of "infectious" allergy.**—*J. infect. Dis.* **82.** 267–293. **488**

A sensitivity of the delayed type has often been referred to as "infectious in type"; this is not strictly correct. In tuberculosis this state can only be produced by the living organism or the intact dead organism. A review of the subject indicates that some element in addition to protein is required before a state of delayed reactivity can be produced.

To rid non-protein constituents of any trace of protein is a formidable task; R. describes in detail his methods of achieving this. He supports the thesis that the bacterial wax is the necessary constituent required to be added to the protein to induce a delayed tuberculin sensitivity, and records a wide range of experiments, the results of which suggest that the chloroform soluble bacillary wax directs the nature of the hypersensitivity response and that the tuberculoprotein is the antigenic stimulus.

An important finding is the conclusion drawn that no parallelism exists between skin reactivity and the presence of antibody.—W. R. KERR.

MARRACK, J. R. (1947.) **Lactation: function and product. Antibodies in milk.**—*Brit. med. Bull.* **5.** 187–189. **489**

This is a review of the antibodies in milk of domestic animals and of human beings.

It is well known that in the cow there is no passage of antibodies through the placental barrier and that the serum of the new-born calf is devoid of globulin containing antibody.

In human beings, however, the bulk of antibodies pass through the placental barrier. The colostrum has a high content of antibody, but it is apparently not required by the new-born baby.

[There is an omission in this review: the absorption time factor, which in the case of calves lies between 24 and 48 hours. Consideration of this factor might be of value in relation to M.'s remarks concerning the Rh antibody.]—W. R. K.

TOMPKINS, E. H. (1946.) **Reaction of the reticuloendothelial cells to subcutaneous injections of cholesterol. Experimental animals: mice.**—*Arch. Path.* **42.** 299–319. **490**

Cholesterol in 5% aqueous glucose was injected subcutaneously into mice. They were subsequently killed and a detailed histological examination was made of smears from the subcutis at the inoculation site. Controls consisted of smears from equivalent areas in untreated mice and from those in mice which had been given injections of the glucose solution without cholesterol.

The cholesterol was deposited as discrete acicular crystals which were electively attracted to the surfaces of the reticuloendothelial cells. The crystals were converted to cholesterol esters and entered the cells where they became segregated in the peripheral part of the cytoplasm as liquid crystals and gradually disappeared. As this occurred, there developed characteristic changes in the elements which stained with neutral red. These enlarged, became more refractive and acid in reaction, assumed a central position as the esters accumulated at the periphery, decreased in size, increased in number and remained acid in reaction. These changes were followed by rapid dissolution and regression after the esters had disappeared.

T. considers that the elements which stained with neutral red represented combinations of cholesterol and cell proteins, and were excreted as such.—L. M. MARKSON.

MIALE, J. B. (1947.) **The hematologic response in dogs to the administration of anti spleen serum.**—*Blood.* **2.** 175–184. **491**

Anti-spleen serum was produced in rabbits injected with antigens prepared from dog spleen. When this diluted anti-cytotoxic serum was administered to healthy dogs (0·1 ml. of a 1 : 10 dilution per 10 kg. bodyweight) it produced an increase in monocytes in the circulation. Large doses of the same antiserum produced the opposite effect and depressed the monocytic cellular system. The possible use of such methods to increase the antibody production presumed to be associated with monocytic activity is suggested. —B. WEITZ.

KYSER, F. A., MCCARTER, J. C., & STENGLE, J. (1947.) **The effect of antihistamine drugs upon serum-induced myocarditis in rabbits.**—*J. Lab. clin. Med.* **32.** 379–386. **492**

The authors briefly review the literature concerning the role of hypersensitivity in rheumatic or rheumatoid myocardial lesions. Using the method described by RICH & GREGORY (1943), they attempted to produce such lesions in rabbits, counteracting the hypersensitivity in two groups with benadryl and in another group with a drug referred to as "No. 1627". These two antihistamine drugs are capable of impeding the development of serum-induced myocardial lesions in rabbits.—L. M. MARKSON.

See also absts. **399** (delayed hypersensitivity in TB.); **402** (c.f.t. in TB.); **420** and **421** (brucellosis); **425** (black disease); **428** (leptospirosis); **437** (trypanosomiasis); **447** (trichomoniasis); **451** and **452** (c.f.t. in F. & M. disease); **458-460**, **463** and **464** (haemagglutination by viruses); **466** and **467** (rinderpest); **476** and **480** (Newcastle disease); **589** and **590** (legal action following inoculation losses).

PARASITES IN RELATION TO DISEASE [GENERAL]

NAUMOV, S. P. (1944.) **[The dynamics of the parasitological fauna of mammals. I. The seasonal character of infection of hares with helminths and coccidia.]**—*Zool. Zh.* **23.** 181–188. [Abst. from abst. in *Biol. Abstr.* Sect. F. **19.** 28–29. (1945).] **493**

This is a summary of results obtained in the course of P.M. examinations of 406 *Lepus timidus* taken in the Vologda and Kirov Districts, and 122 *Lepus europaeus* taken in the Northern Caucasus. Infestation of the former with *Protostrongylus* and *Trichostrongylus* (nematodes) is maximal in the spring and minimal in the middle of the summer, with *Dicrocoelium lanceatum* (trematode) and with *Cittotaenia pectinata* and *Cysticercus pisiformis* (cestodes) maximal in the latter half of summer, and minimal in winter. The infection curves of *L. europaeus* with *Cysticercus*, *Trichocephalus* and *Coccidium* have two peaks, with maxima in spring and autumn. A similar curve characterizes infection of *L. timidus* with coccidia.

PARASITES IN RELATION TO DISEASE [ARTHROPODS]

BRUCE, W. N., & DECKER, G. C. (1947.) **Fly control and milk flow.**—*J. econ. Ent.* **40.** 530–536. [Summary copied *verbatim.*] **494**

Heterogeneity in gross herd milk production

data makes it difficult to establish significances among treatments. In every instance herds treated with DDT or *Rhothane* maintained milk production better than herds treated with repellent-type sprays. Poorly managed herds which relied largely on pasture for food showed a greater response to treatment than well-managed herds receiving excellent care and heavy supplemental rations. There was a high degree of inverse correlation between changes in milk production and fly abundance (a correlation coefficient of –·760, with ·666 for the 5 per cent level and ·789 for the 1 per cent level).

Animals in continuous lactation showed highly significant changes in the slopes of their milk production gradients at the time of treatment.

Correlation between changes in milk production and fly abundance was highly significant in the case of selected animals in continuous lactation (correlation coefficient of –·82 with ·666 for the 5 per cent level and ·798 for the 1 per cent level).

STEINER, G. (1942.) Eine Zuchtweise für Fleischfliegen. [**A method of breeding blowflies.**]—*Zool. Anz.* **138.** 97–106. **495**

The flies are kept in small wooden boxes warmed by a 15–25 watt electric bulb, a paper curtain separating the box into a lighter, warmer and a darker, cooler compartment.

The eggs are hatched in wide-necked flasks closed with gauze and containing cotton wool and raw minced beef in quantities depending on the number of eggs. It is recommended to keep the quantity of meat offered just below the maximum amount which the larvae could eat during their entire development. A graph is given showing the body-size of the imagines as a function of the amount of food offered to the larvae.

Larvae which have stopped feeding are cleaned by a method described and transferred for pupation to Petri-dishes containing moist cotton wool; they are aired once a day. The emerging flies are transferred to the breeding boxes after a half to one day.

Best breeding results by this method have been obtained with *Phormia regina.* At temperatures up to 35°C. 500 flies yield up to 1·2 g. of eggs (about 16,000 eggs) daily on the third to the fifth day after transfer to the breeding box. Bigger breeding boxes are recommended for the more lively and less quickly copulating *Lucilia caesar* and also for *Sarcophaga carnaria. Calliphora erythrocephala* should be bred at lower temperatures (22°–25°C.).—J. JONAS.

I. STEINER, G. (1942.) Methodische Untersuchungen über die Geruchsorientierung von Fleischfliegen. [**Methodical investigations on the olfactory orientation of blowflies.**]—*Z. vergl. Physiol.* **30.** 1–38. **496**

II. STEINER, G. (1942.) Zur quantitativen Analyse tierischer Geruchsreaktionen. [**The quantitative analysis of the olfactory reactions of animals.**]—*Naturwissenschaften.* **30.** 647–648. **497**

I. The attractive or repulsive effect of scents ("osmagogue effect") on blowflies (*Phormia regina*) was investigated, using both male and female imagines, 3–4 days old, all derived from the same parent and having been bred for ten generations under equal conditions.

The tests were carried out in boxes (90 × 24·5 × 27·5 cm.), illuminated by two electric bulbs in their right half and containing 16 traps in their left half. The traps, consisting of 50 ml. conical flasks fitted with wire-gauze funnels, were arranged in chess-board fashion, eight of them containing the odoured bait (meat juice or amine solutions) and the other eight an odourless control (an aqueous solution having the same water-vapour tension as the bait).

The quotient obtained by dividing the number of flies trapped on odoured bait by the number of flies trapped on control bait, is used to characterize the osmagogue effect. The limit of error in these experiments was ±5–6% for a total of 1,000–1,400 flies trapped and about ±12% for a total of 450–900 flies.

The dimensions of test-boxes and test-arrangement had no significant effect on the trap-quotient.

In concentrations between 0·1% and 0·2% methyl-, trimethyl-, diethyl-, and triethyl-amine have a repulsive effect and dimethyl- and ethylamine an attractive one. Experiments with varying amine concentrations indicate that there are concentration regions of attractive and of repulsive effect, respectively, for the different amines.

The observation that female flies react more strongly to odour than do male flies is discussed.

II. Further experiments were carried out, using the above method, in order to ascertain whether the difference in the olfactory reactions of male and female blowflies is due merely to a different degree of development of the scent-perceptive power or whether the differential behaviour of the sexes depends on a central mechanism. The experimental evidence supports the latter possibility.

On the basis of a series of tests with ethylamine in different concentrations, three components of the olfactory reaction are distinguished: (i) a "feed stimulus", (ii) a "breeding-place stimulus", and (iii) a "protection stimulus".

—J. JONAS.

JAMES, M. T., & GASSNER, F. X. (1947.) **The immature stages of the fox maggot, *Wohlfahrtia opaca* (Coq.).**—*J. Parasit.* **33.** 241–244. **498**

The egg, first, second and third larval instars, and pupa of the sarcophagid fly *Wohlfahrtia opaca*, a parasite of foxes and mink in the Western U.S.A. and Canada, are described. A key is given for distinguishing the larval instars of this species from those of the other myiasis-producing species of the genus (*W. magnifica* and *W. vigil*).—E. PARKER POLLARD.

OLDROYD, H. (1947.) **Notes on the type-specimens of African Tabanidae (Diptera) described by Mr. H. F. Carter (1912, 1915).**—*Ann. trop. Med. Parasit.* **41.** 234–238. **499**

A comparison of specimens of African tabanidae described in 1912 and 1915, with further extensive West and South African material collected since those dates. The original descriptions were found to be good. Five species of *Tabanus* and six of *Haematopota* are involved. The separation of these species from some species since described is worked out.—L. DAVIES.

TARZWELL, C. M. (1947.) **Effects of DDT mosquito larviciding on wildlife. I. The effects on surface organisms of the routine hand application of DDT larvicides for mosquito control.**—*Publ. Hlth Rep., Wash.* **62.** 525–554. **500**

This paper is the first of a series dealing with investigations on the effect of different forms of D.D.T. on wild life of economic importance, in relation to its use for the control of anopheline larvae. The present results are concerned with the effect of routine hand application of the larvicide in the form of dusts, stable and unstable emulsions, and in solutions, on surface forms other than anophelines. The studies were made on natural ponds in three areas, and on 14 artificial ponds. The larvicides were applied by rotary hand dusters, atomizers, and air-pressure hand sprayers. The materials most commonly used were a 1% D.D.T. dust in Electro FD No. 2 (a specially treated calcium carbonate dust), and solutions of D.D.T. in fuel oil applied at the rate of 1 gal. or half gal. per acre. The actual dosages used varied from 2–0·025 lb. of D.D.T. per acre, and routine treatments were at weekly intervals.

Gross observations were made on the larger surface forms at the time of treatment and 24 and 48 hours afterwards; and quantitative surface samples were taken before and after treatment to determine the effect of individual treatments. Similar series of samples were taken in control ponds. Samples were taken by means of a screen-dipper and strainer-pan technique. Various methods of obtaining representative samples were tried, and paired samples in the vicinity of ten numbered stakes in each pond were finally adopted as the standard technique.

Stable emulsions, formed by organic solvents, D.D.T., an emulsifier, and water, were soon found to be detrimental to aquatic fauna since, applied at 0·2 lb. of D.D.T. per acre, they killed many aquatic insects and fish. They were therefore abandoned in favour of quick-breaking emulsions or solutions of D.D.T. with a spreader. To save labour, D.D.T. solutions in fuel oil or kerosene, applied at 1 gal. per acre, were used instead of water suspensions.

The effects of various solvents used alone were investigated in several series of tests, and it was found that kerosene was less toxic than fuel oil and that alcohol and similar solvents killed very few insects. However, in combination with D.D.T., the potency of the insecticide masked differences in the toxicity of the solvents.

Gross observations indicated that routine dusting with D.D.T. at 0·1 lb. per acre caused little apparent damage to the surface organisms, although such treatment had, in time, some effect on seasonal trends :– *e.g.*, all insects, and particularly chironomids, were greatly reduced, while oligochaetes steadily increased in numbers.

Greater changes, in this respect, were produced by solutions of D.D.T. in fuel oil. As little as 0·025 lb. D.D.T. per acre of this also killed large surface insects, but proportionately greater kills were given by applications of 0·1 lb. per acre. As with dusts, few significant changes were caused by single treatments, but the seasonal effects of routine treatment were quite marked :– Oligochaeta, Nematoda and Copepoda increased, while Chironomidae, Hemiptera, Coleoptera and Ephemeroptera decreased.

Detailed experimental data are presented in the form of numerous tables which cannot be adequately summarized, but the general trend of the results indicates that the treatments produced some reduction in the available supply of fish food. Seasonal changes, produced by routine treatments in particular, tended to act in this way, in that those forms which decreased in numbers were generally larger and more readily taken by fish than those which increased. T. concludes, however, that the changes noted to date would not be sufficient to affect the breeding stock of fishes.

[Few of the groups of organisms recorded in this investigation are of direct veterinary interest, but the results indicate the need for caution in the disposal of dipping washes or sprays, particularly in preserved waters.]—E. PARKER POLLARD.

DAVIS, G. E. (1947.) **A note on the larval stage of the argasid tick *Ornithodoros moubata* (Murray) 1877.**—*J. Parasit.* **33.** 495–496. **501**

The larvae of *Ornithodoros moubata* are

quiescent and remain in the split egg-shell after hatching, until a few hours later they moult and throw off the egg case and larval skin together. Although this feature of the larvae of this tick has been known since 1904, misconceptions exist among some workers, who suppose that the larvae are active and take a blood feed.—L. DAVIES.

BRENNAN, J. M. (1947.) **An instance of the apparent toxicity of man to ticks.**—*J. Parasit.* **33.** 491–494. **502**

Experiments are described on a normal 38-year-old male American who exhibited remarkable toxicity to the adults of *Amblyomma americanum* and to the adults and nymphs of *Dermacentor andersoni*. In some instances the ticks were killed or paralysed after being held in the clenched hand or in the bend of the flexed arm of the subject, for as short a time as 10–20 min. Toxicity to the ticks appeared to be greater when confined on his skin where visible sweating was occurring, and less where no visible moisture was accumulating. Ticks were unaffected when close to but not in actual contact with the skin, and were markedly repelled from the skin of the subject. The toxic substance appeared to be associated with the sweat.—L. DAVIES.

MCPHERSON, E. A. (1947.) **Demodectic mange in the bovine.**—*Vet. Rec.* **59.** 148. **503**

In infection with *Demodex folliculorum* var. *bovis* in a cow there were nodules varying from the size of a lentil to that of a hazelnut, most numerous over the scapula and on the point of the shoulder but absent from the head and anterior part of the neck. The following were the stages in the development of the nodules :– first a group of four or five hair follicles were enlarged, with the epidermis intact ; the follicles then fused, with increased reaction in the dermis and central necrosis of the epidermis, the lesion ruptured with discharge of thick pus, and this was followed by desiccation and healing. Very large numbers of larval and adult mites were present in the pus. There was no pruritus. The need for differentiating the condition from " skin tuberculosis " is mentioned.—E. PARKER POLLARD.

BAKER, D. W. (1947.) **Cattle scabies in the Northeastern States.**—*J. Amer. vet. med. Ass.* **110.** 379–381. **504**

The planning and implementing of an educational campaign for the eradication of cattle scabies are outlined, including broadcast talks, propaganda and educational demonstrations and discussions for laymen and the holding of special instructional courses for veterinarians.

From personal experience in the field, B. considers that 1,500 herds are infected in New York State.

Sarcoptic mange is the commonest form encountered, but the chorioptic and psoroptic types also occur, and also the demodectic type. Infection of human beings with the bovine sarcoptic type was frequently noted. The disease causes great economic losses.—E. PARKER POLLARD.

DRAZ, O. (1947.) **The use of " Gammexane " in the treatment of sarcoptic mange in camels.** —*Vet. Rec.* **59.** 548–549. **505**

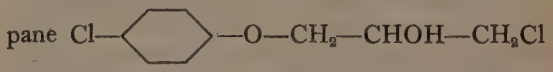
A liquid concentrate containing 7% of the γ-isomer of benzene hexachloride diluted 1 : 13 in kerosene to give 0·5% γ-isomer, was smeared on two badly affected camels. Transient signs of skin irritation, which may have been due to the kerosene or to stimulation of the mites, were observed. The animals were cured within three weeks, a second application being unnecessary.

Less than two gal. per head of a fluid dip, diluted 1 : 150 to give a wash strength of 0·01% γ-isomer, was applied by spraying five affected camels, four times at ten-day intervals. They were cured and new hair was growing after 30 days. It is noted that fewer treatments with this preparation might have been effective.

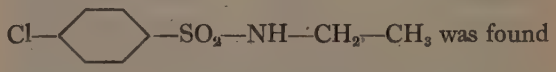
Infestation with *Hyalomma aegyptium* was considerably reduced by the dip.—E. P. P.

BURCKHARDT, H., & DU PAN, R. M. (1946.) Behandlung der Scabies mit einem neuen Präparat. [**Treatment of scabies with a new preparation.**]—*Praxis.* **35.** 330–333. [Abst. in *Bull. Hyg., Lond.* **21.** 599. (1946), copied *verbatim.* Signed : KENNETH MELLANBY.] **506**

" G.808 ", a fat-free salve, containing the two substances 1-p-chlorphenoxy-2-oxy-3-chlorpropane



and the ethylamide of p-chlorbenzol sulphonic acid



in vitro to be rapidly fatal to the mite *Psoroptes*, and was more effective under these conditions than some of the accepted remedies for human scabies (benzyl benzoate, " tetmosol ", " mitigal ", etc.). It was therefore used in 10 per cent. and 6 per cent. concentrations to treat scabies in refugee children in Switzerland. The majority of these patients had severe secondary infection. Good results were obtained, the majority being cured after one application. [As, however, this result has been obtained by practically every worker who has used benzyl benzoate or " mitigal " with proper precautions, " G.808 " cannot on this evidence be claimed to be any real advance. Moreover, as sulphones have been reported to be toxic under certain circumstances, this new preparation should be treated with caution.]

HAND, E. A. (1946.) **Diagnosis of infestation with "Sarcoptes scabiei" var. "hominis". Discussion on life cycle of organism.**—*U.S. Nav. med. Bull., Wash.* **46.** 834–844. [Abst. in *Bull. Hyg., Lond.* **21.** 599. (1946), copied *verbatim.* Signed: KENNETH MELLANBY.] **507**

The method of diagnosis of scabies advocated in this paper is to "slice, scrape and smear". A lesion likely to contain a mite is found, and this is either sliced off with a razor blade or scraped with a scalpel, the tissue removed being then mounted on a slide and examined under the microscope. It is insisted that this method of examination is more likely to be successful than an attempt to remove a *Sarcoptes* with a needle. [The reviewer disagrees. He has taught hundreds of medical officers and even untrained orderlies to find mites and to remove them with a needle and has never found any difficulties. Mites, eggs, burrows, etc., can also be sliced off, but the reviewer would leave this task to the expert.]

Several good microphotographs of specimens of itch mites are given, and some notes on the life-story; no new information is included. Treatment including five applications of benzyl benzoate is said to cure "a large number of cases" and the author does "not share the optimism of those who report almost 100 per cent. cure from one application." [Many workers in Britain have definite proof of cure in most cases from one application of benzyl benzoate, but only when properly done under close supervision. A high proportion of failures is only found when treatment is improperly given, or when diagnosis is wrong and other non-scabietic conditions are being treated as scabies.]

See also abst. **509** (acarine host of tapeworm).

PARASITES IN RELATION TO DISEASE [HELMINTHS]

STUNKARD, H. W. (1945.) **The morphology of *Tamerlania bragai* Dos Santos, 1834.**—*J. Parasit.* **31.** 301–305. **508**

An account is given of the morphology of *Tamerlania bragai*, a monostome, parasitizing the renal ducts of domestic pigeons, fowls and certain wild birds.—GEORGE M. URQUHART.

RUNKEL C. E., & KATES, K. C. (1947.) **A new intermediate host (*Protoschelobates seghettii*, n. sp.: Acarina: Scheloribatidae) of the sheep tapeworm, *Moniezia expansa*.**—*Proc. helminth. Soc. Wash.* **14.** 64–67. **509**

Soil samples from a pasture plot which had not been grazed for four years contained large numbers of oribatid mites, including species reported to be the intermediate hosts of sheep tapeworms. A thick layer of sheep droppings containing eggs of *Moniezia expansa* was spread on the plot in 1946. In 1947, oribatid mites were collected from turf samples and several species found to contain cysticercoids of *M. expansa*. A new species, *P. seghettii*, was found, a detailed description and drawings of which are given.

Cysticercoids obtained from *P. seghettii* and other species were fed to parasite-free lambs and infections of *M. expansa* resulted in each case. Cysticercoids obtained from *P. seghettii* alone have not been fed to parasite-free lambs. 6% of the mites contained cysticercoids and the numbers varied from one to three. In addition to *P. seghettii*, *Galumna negra*, *Galumna emarginata*, *Galumna obvius* and *Scheloribates laevigatus* have been reported as intermediate hosts of *M. expansa*. A bibliography is given.—BERYL A. THURSTON.

GOBLE, F. C., & KUTZ, H. L. (1945.) **Notes on the gapeworms (*Nematoda*: *Syngamidae*) of galliform and passeriform birds in New York State.**—*J. Parasit.* **31.** 394–400. **510**

The incidence of gapeworm infestation in various wild birds in New York State is discussed; because of migratory and environmental factors no accurate figures can be stated. Younger birds seem to be more susceptible to the parasite than older ones. No infections were observed in 118 starlings of all ages nor in adult crows. This is contrary to British experience. There are observations on the extent of infections which are all attributed to *S. trachea*, except those in the robin, considered to be due to *S. nevulae*. The authors give a key to the species of *Syngamus*.—G. M. U.

SPINDLER, L. A. (1947.) **The effect of experimental infections with ascarids on the growth of pigs.**—*Proc. helminth. Soc. Wash.* **14.** 58–63. **511**

Piglets were fed daily at intervals over a period of 126 days with approximately 2,000 embryonated eggs of *Ascaris lumbricoides* and the weight gains recorded as compared with uninfected litter mate controls.

By the tenth day the dosed pigs had laboured respiration and were off their food. The dosage was then discontinued for the following seven days by which time the symptoms had disappeared. Eggs were again fed for a further seven days, but no symptoms developed. The viability of the eggs was tested by feeding to white mice, all of which died from verminous pneumonia.

At the end of the period of dosage two of the test pigs became moribund, and all the pigs were weighed, slaughtered and examined for ascarids. No worms were found in the controls; the number of worms found in the infected pigs ranged

from 12 to 109 and the weight gains of the infected pigs were inversely proportional to the number of worms found P.M.

The growth of the infected pigs was interfered with, firstly at the time of the larval invasion of the lungs, and again, after the worms had attained sexual maturity, whereas there were few harmful effects during the period of growth and development of the worms.—D. LUKE.

MORGAN, D. O., & SLOAN, J. E. N. (1947.) **Researches on helminths in hill sheep. With special reference to seasonal variations in worm egg output.**—*Scot. Agric.* **27.** 28–35. **512**

Variations in the helminth egg output of Blackface sheep throughout two successive years on two Scottish Border hill farms are recorded.

Monthly faecal samples from the same 160 sheep were examined by a modified MCMASTER technique [see *V. B.* **10.** 217]. The lowest egg output was found to occur in January and February, with a peak in April-May and a gradual decrease during the remainder of the year.

See also abst. **493** (parasites of hares).

Fluctuation in the results recorded in individual sheep are discussed.—G. M. URQUHART.

VAN CLEAVE, H. J. (1947.) **Thorny-headed worms (*Acanthocephala*) as potential parasites of poultry.**—*Proc. helminth. Soc. Wash.* **14.** 55–58. **513**

In this note the author emphasizes the possible importance of the *Acanthocephala* in poultry in view of their occurrence in a variety of resident and migratory wild birds. Infection would, however, require the ingestion of infected intermediate hosts, such as certain arthropods. Infestation with these worms has been reported in poultry in North America, India and the Philippines. The author considers that the North American species of *Mediorhynchus*, *M. grandis* has the best opportunity of becoming established in domestic poultry because it lives normally in such birds as grackles, meadow larks, and sometimes in crows and its intermediate host is a species of grasshopper.—J. D. BLAXLAND.

SPONTANEOUS AND TRANSMISSIBLE NEOPLASMS AND LEUCAEMIAS [INCLUDING FOWL PARALYSIS]

DECHAMBRE, E., & DRIEUX, H. (1945.) Cancer de la thyroïde chez une panthère d'Afrique (*Felis pardus*, L.). **[A tumour in the thyroid of a panther.]**—*Bull. Acad. vét. Fr.* **18.** 187–192. **514**

An account of observations on goitre in a panther. Considerable detail is given of the symptoms in the animal and of the naked eye and microscopic findings P.M.—M. R. ORMEROD.

HADDOW, A., & KON, G. A. R. (1947.) **Chemical carcinogenesis. I. Nature of carcinogenic compounds. Chemistry of carcinogenic compounds.**—*Brit. med. Bull.* **4.** 314–325. **515**

BERENBLUM, I., HOLIDAY, E. R., & JOPE, E. M. (1947.) **Chemical carcinogenesis. I. Nature of carcinogenic compounds. Some physical methods of investigating carcinogenic hydrocarbons.**—*Ibid.* 326–331. **516**

HADDOW, A. (1947.) **Chemical carcinogenesis. II. Mechanism of carcinogenesis. Mode of action of carcinogens.**—*Ibid.* 331–342. **517**

BERENBLUM, I. (1947.) **Chemical carcinogenesis. II. Mechanisms of carcinogenesis. Cocarcinogenesis.**—*Ibid.* 343–345. **518**

CRABTREE, H. G. (1947.) **Chemical carcinogenesis. II. Mechanism of carcinogenesis. Anti-carcinogenesis.**—*Ibid.* 345–348. **519**

DICKENS, F. (1947.) **Chemical carcinogenesis. II. Mechanism of carcinogenesis. The influence of the solvent on the carcinogenic response.**—*Ibid.* 348–354. **520**

BOYLAND, E., & WEIGERT, F. (1947.) **Chemical carcinogenesis. III. Metabolism of carcinogenic compounds.**—*Ibid.* 354–359. **521**

HIEGER, I. (1947.) **Chemical carcinogenesis. IV. Carcinogens of biological origin. Carcinogenic substances in human tissues.**—*Ibid.* 360–363. **522**

PEACOCK, P. R. (1947.) **Chemical carcinogenesis. IV. Carcinogens of biological origin. The carcinogenic action of heated fats and lipoids.**—*Ibid.* 364–367. **523**

BURROWS, H., & HORNING, E. S. (1947.) **Chemical carcinogenesis. V. Remote carcinogenic action. Oestrogens and neoplasia.**—*Ibid.* 367–377. **524**

DODDS, E. C. (1947.) **Chemical carcinogenesis. V. Remote carcinogenic action. A note on the carcinogenic action of stilbene derivatives.**—*Ibid.* 378–379. **525**

BONSER, G. M. (1947.) **Chemical carcinogenesis. V. Remote carcinogenic action. Experimental cancer of the bladder.**—*Ibid.* 379–382. **526**

BIELSCHOWSKY, F. (1947.) **Chemical carcinogenesis. V. Remote carcinogenic action. The carcinogenic action of 2-acetylaminofluorene and related compounds.**—*Ibid.* 382–385. **527**

ORR, J. W. (1947.) **Chemical carcinogenesis. V. Remote carcinogenic action. The production of liver tumours by azo compounds.**—*Ibid.* 385–388. **528**

HENRY, S. A. (1947.) **Chemical carcinogenesis.**

VI. Occupational cancer. Occupational cutaneous cancer attributable to certain chemicals in industry.—*Ibid.* 389–401. **529**

CURRIE, A. N. (1947.) **Chemical carcinogenesis. VI. Occupational cancer. The role of arsenic in carcinogenesis.**—*Ibid.* 402–405. **530**

GOLDBLATT, M. W. (1947.) **Chemical carcinogenesis. VI. Occupational cancer. Occupational cancer of the bladder.**—*Ibid.* 405–417. **531**

HADDOW, A. (1947.) **Chemical carcinogenesis. VII. Chemotherapy of cancer.**—*Ibid.* 417–426. **532**

This number of the fourth volume (1947) of the *British Medical Bulletin* is devoted to the subject of chemical carcinogenesis. The 20 authors are from 11 different centres in London, Oxford, Leeds, Manchester, Sheffield and Glasgow.

A good general cross-section of the subject, up to 1947, has been presented and each paper is completed by an extensive bibliography.

—MALCOLM WOODBINE.

BITTNER, J. J., WATSON, C. J., HAWKINSON, V., & ANDERSON, E. A. (1946.) **The possible association between porphyrins and cancer in mice.**—*Cancer Res.* **6.** 337–343. [Authors' summary copied *verbatim.*] **533**

The extraction of porphyrins from the harderian glands of virgin and breeding females of various inbred stocks of mice and F_1 hybrids would suggest that :–

There is no decrease in the porphyrin content of the harderian glands with increasing age.

There is no relationship between the presence of the active milk agent and the porphyrins.

There is no simple correlation between "inherited susceptibility" to mammary and lung cancer and the porphyrins.

In every stock the breeding female showed higher porphyrin concentrations in the harderian glands than did the virgin females. Spayed females may show higher reading than virgin females of the same stock.

The maximal concentrations in the various groups were attained at different ages.

The apparent relationship between the porphyrins and mammary cancer, as described by others, may be due to a correlation of unknown nature between the porphyrins and the hormones. In virgin females this association may involve the "inherited hormonal influence".

JACKSON, C. (1948.) **Relationship of glioma to encephalitis in the domestic fowl, and an associated parasitic agent. [Correspondence.]**—*Nature, Lond.* **161.** 441–442. **534**

Fifty cases of glioma in the brain of the domestic fowl were examined. A number of bodies which J. considers to represent phases of a specific parasite are described.—F. D. ASPLIN.

KULL, K. E. (1947.) **Recent experiences regarding the treatment of fowl paralysis. Preliminary report.**—*Skand. VetTidskr.* **37.** 559–560. [In English.] **535**

The incidence of fowl paralysis in infected flocks declined after addition to the food of 2% dried brewers' yeast and 0·02% of a mineral mixture composed of equal parts of the sulphates of ferrous iron, manganese and cobalt.—F. D. A.

NUTRITIONAL AND METABOLIC DISORDERS

SHEEHY, E. J. (1948.) **Calf rearing.**—*Agriculture, Lond.* **55.** 189–197. **536**

The influence of the plane of nutrition of the pregnant cow on the well being of the developing calf is discussed, with a description of the effects of a deficiency of phosphorus, iodine and vitamin A in the diet of the pregnant cow on the vitality of the calf at birth. The part played by the colostrum in the transfer of antibodies to the calf is stressed. The density of the milk clot in the calf's stomach depends on the ratio of casein to albumin and globulin: when this ratio is high, as is the case in cows' milk, the clot tends to be dense. The ratio tends to go up in the cow's milk as lactation progresses.

So-called nutritional scours are common in pail-fed calves, especially where feeding is only twice daily. Such digestive upsets are due to dense curd formation. The beneficial result which follows the substitution of water for whole milk in the diet of these cases is due to the fact that water encourages the secretion of rennet which attacks the milk clot in the stomach.

S. describes methods of rearing and suitable rations with and without separated milk; the importance of suitable stabling and of rational pasture management is emphasized. The management of suckled calves is dealt with briefly.—D. L.

TOBY, C. G., & NOBLE, R. L. (1947.) **Effect of dietary protein on susceptibility of rats to trauma.**—*Canad. J. Res.* Sect. E. **25.** 216–226. **537**

TOBY, C. G., & NOBLE, R. L. (1947.) **Influence of replacement therapy on the increased susceptibility of protein-deficient rats to trauma.**—*Ibid.* 227–236. **538**

Tolerance of rats to trauma produced by exposure in a revolving drum [see *V. B.* **15.** 281] was related to the amount and type of protein in the diet. Protein levels of from 13–18%

with a daily intake of 1–1·5 g. appeared to give the greatest protection and casein, wheat germ, gelatin digests, lactalbumin digests and amigen were particularly effective. Improvement in the tolerance of adult rats was noted as early as the third day after administration and was maximum after 7–14 days on the diets. Levels of casein and wheat germ protein that did not support growth imparted considerable protection. With levels of 12–15% casein mortality rate was reduced from 100% to less than 25% when rats were subjected to 800 turns in the trauma drum.

Complete absence of protein from the diet for two weeks previous to trauma greatly increased the susceptibility of rats to shock. Protein feeding restored normal tolerance but five or six days' feeding was necessary to correct two weeks' depletion. The amount of protein consumed was an important factor when low levels of 0·08–0·68 g. per day were used. Casein, amigen and wheat germ protein were effective for replacement. After protein depletion of one month or more, two or three weeks of protein feeding was required to restore normal tolerance. No individual amino acid was found to afford protection against trauma although a mixture of the essential amino acids in one case had some effect. Gelatin was an effective protein for replacement therapy. In a single experiment in which a mixture of glutamic acid and glycine of the same total nitrogen content as gelatin was administered the same degree of protection was afforded as by gelatin.—J. W. P.

SMITH, S. G. (1946.) **Potassium vs. biotin in the treatment of progressive paralysis in dogs.** —*Proc. Soc. exp. Biol. N.Y.* **63.** 339–341. **539**

A progressive paralysis, fatal in 24 hours, occurs in dogs on a diet lacking some of the vitamin B complex and containing 0·006% potassium. Rapid recovery commenced in three dogs 3–6 hours after administration of a total dose of at least 200 mg. potassium chloride per kg. body weight. There was no recurrence for 6–10 weeks.

Treatment with biotin, the dose used in one case being 240 μg. per kg. body weight, produced slow improvement after eight hours. Relapses occurred in 4–48 hours. The biotin solution may contain potassium to the extent of 0·85 μg. per ml. but the amount administered in this way is insignificant.

The number of dogs treated by each method is not stated. Data are being collected to determine the relationship between potassium and biotin.—E. J. H. FORD.

HALPERN, G. R., BIELY, J., & HARDY, F. (1947.) **Utilization of vitamin A in water emulsion.**—*Science.* **106.** 40–41. **540**

Two different grayfish liver oils of similar potency, one freshly prepared, the other considerably oxidized through long storage, were each incorporated in sunflower seed oil and in water to potencies of both 50 and 150 I.U. per ml. The water emulsions were prepared by using 1% methyl cellulose as emulsifying agent. Both water and oil solutions were stabilized with 0·05% of mixed tocopherols and 0·1% of soya bean lecithin. The preparations, which were assayed biologically on chicks, were given *per os* at the rate of 25 and 75 I.U. daily. The fat intake of the chicks receiving the water emulsions was adjusted to that of the other groups by administering the appropriate amount of sunflower seed oil. All groups receiving the vitamin in water emulsion grew at a markedly greater rate than those fed the oil preparation. It is concluded that the use of water emulsions of vitamin A may be of practical value in biological assays, especially in those cases where fat metabolism is disturbed.—E. M. CRUICKSHANK.

HANSEN, R. G., PHILLIPS, P. H., & SMITH, V. R. (1946.) **Colostrum milk and its vitamin A content.**—*J. Dairy Sci.* **29.** 809–814. **541**

Eighteen heifers were maintained without access to pasture on a ration of alfalfa hay, corn silage and a grain mixture. In the first and second lactations the colostrum contained on the average 308 and 133 μg. of vitamin A per 100 ml., respectively. Seven-fold variations in potency were observed between individuals, although dietary and environmental conditions were identical. The ingestion of colostrum considerably increased the plasma vitamin A content of the new-born calf, the increase being roughly proportional to the amount in the colostrum. In cows isolated from their calves, the injection of 10 I.U. of oxytocin [a pituitary hormone] lowered the concentration in the second milking. The vitamin A content of colostrum dropped from its value of 52,600 I.U. per 10 lb. of milk in the first milking to 19,300 I.U. in the third milking. Subsequently there was a gradual drop in potency over a period of several days to the level found in milk in mid-lactation, namely, 3,140 I.U.—E. M. CRUICKSHANK.

EATON, H. D., SPIELMAN, A. A., LOOSLI, J. K., THOMAS, J. W., NORTON, C. L., & TURK, K. L. (1947.) **The effect of a massive dose at birth of vitamins A and D upon blood plasma levels and liver storage in Holstein calves.**—*J. Dairy Sci.* **30.** 795–802. **542**

Six Holstein calves were given at birth a single dose of pellets containing 125,000 I.U. of vitamin A, 25,000 I.U. of vitamin D and 250 mg. of nicotinamide chloride, while six similar calves were not dosed. At 42 days the vitamin A content of the plasma per 100 ml. in the dosed and control groups was 14·4 and 10·9 μg. respectively, while

the corresponding figures for vitamin D were 90 and 55 I.U. At birth the level of carotene in the plasma in both groups was similar, but after two weeks a significant depression in the plasma carotene levels of the experimental animals was apparent. This depression continued throughout the 42 days of the investigation. The storage of vitamins A and D in the livers of the supplemented calves was significantly greater than in the control animals, but no difference in the storage of carotene was observed.—E. M. CRUICKSHANK.

HIBBS, J. W., KRAUSS, W. E., POUNDEN, W. D., MONROE, C. F., & SUTTON, T. S. (1946.) **Studies on milk fever in dairy cows. II. The effect of vitamin D on some of the blood changes in normal and milk fever cows at parturition.** —*J. Dairy Sci.* **29.** 767–781. [For part I, see *V.B.* **18.** 121.] **543**

No effect on serum Ca, Mg, P or phosphatase was observed when one million units of vitamin D in the form of irradiated dried yeast was given for four weeks prior to, and one week after, parturition. There was a slight increase in Ca and P, and a slight decrease in Mg when two million units were given. Both serum Ca and P decreased markedly immediately before the onset of milk fever, the lowest levels being reached just after the symptoms appeared. There was a concurrent increase in the serum Mg. The feeding of one or two million units of vitamin D raised the level of the vitamin in the blood to two and four times that of the normal, respectively. Though cows with milk fever had the lowest level of vitamin D in the blood, the administration of even two million units did not have a preventive effect. The decrease in the levels of vitamin D, vitamin A, carotene and protein in blood which occurs at parturition is probably associated with the production of colostrum.—E. M. CRUICKSHANK.

See also absts. **400** (vitamin C and TB.); **607** (some elements in plants and animals: a textbook); **581** (currents in biochemical research).

DISEASES, GENERAL

BOERNER, F., & LUKENS, M. (1946.) **A quantitative fixation of complement test for the diagnosis of syphilis, leptospirosis, echinococcus disease, malaria, bacterial and other diseases.**—*Amer. J. clin. Path.* Tech. Sect. **16.** No. 1. 4–12. **544**

Essentially the haemolytic complement fixation test with the difference that the amount of complement is varied, not the test serum.

—L. M. MARKSON.

PIRES, A. (1946.) Contribucion al estudio, en las yeguas, del habito de "Tragar Aire", de la fistula recto-vaginal y de la cloaca recto-vaginal. **[Pneumo-vaginitis in mares.]**—*An. Fac. Med. vet., Univ. La Plata.* **9.** 93–114. **545**

Four stages occur in this condition (a) a flaccidity of the lips of the vulva enabling air to be drawn in to the vagina; (b) laceration of the upper commissure; (c) recto-vaginal fistula; (d) formation of a recto-vaginal "cloaca" or common orifice. All are accompanied by a muco-purulent discharge producing eczema and pruritus and causing sterility.

P. describes a plastic operation for the cure of the condition.—R. MACGREGOR.

CLAY, H. A. (1946.) **The mine detector as an aid to detection of metallic foreign bodies in cattle.**—*Vet. Rec.* **58.** 237. **546**

C. describes the use of the mine detector for the detection of ingested foreign bodies in cattle. In a cow with symptoms of traumatic gastritis, there was a response from the instrument and after rumenotomy a piece of wire 3 in. long was found in the antero-ventral aspect of the reticulum. In a second cow in which there was a response, two 2 in. nails were found in the reticulum after rumenotomy. In a third test on 32 cows which appeared normal, a positive response was obtained from the instrument in ten of the animals.

—A. H. HOGG.

BEGG, H., & WHITEFORD, W. A. (1948.) **Acute interstitial pulmonary emphysema of bovines.** —*Vet. Rec.* **60.** 135. **547**

The condition occurs in summer and autumn; there is no rise of temperature, and appetite and milk secretion are little affected. Secondary infection often occurs. Mortality is about 15%. The lesions are those of severe interstitial emphysema. Treatment with adrenalin is useless. The authors refer to a migration of immature spiders at the season when this disease is prevalent and suggest that the spiders and their webs might have something to do with its causation.—R. M. L.

YOUNG, G. A., Jr., & UNDERDAHL, N. R. (1947.) **An epidemiological study of baby pig disease.** —*Cornell Vet.* **37.** 175–203. **548**

This condition is responsible for a heavy death rate in young pigs within a few days of birth. It appears to have become more prevalent in recent years. Its cause is not known, but it is generally considered that faulty nutrition and bad management play an important part in outbreaks of this disease.

The data in this study were collected from the records of 1,012 litters in a herd between March 1944 and March 1947, during which period 40% of the young pigs died before weaning. Deaths occur typically within a few days of birth. Affected new-born pigs suck for a short

time and then vomit; shivering fits occur. If they survive for 24 hours there is diarrhoea and death quickly follows. Emaciation and dehydration are marked. Pathological findings are not constant. Fatty changes may occur in the liver and kidneys. Deposits of urates are commonly found in the kidneys.

In addition to the baby pig disease the following diseases were diagnosed in weaned pigs of the herd during the period under review: infectious enteritis, necrotic enteritis, salmonellosis, erysipelas and swine fever. The baby pig disease could not be co-related with any infectious agent, nor did it appear to be associated with the system of nutrition practised. There did not appear to be any hereditary basis.

The authors put forward the hypothesis that the disease is due to what is called a reverse anaphylactic shock, the assumption being that the sows are exposed to a hypothetical infection from the weaned pigs, with the resultant stimulation of antibody formation; at the next pregnancy sensitization of the foetus thus occurs and at parturition the colostrum is rich in the sensitizing antibodies which, being readily absorbed by the young pig, rapidly induce shock. Possible antigens such as the virus of swine fever, and swine influenza are discussed.—D. LUKE.

YOUNG, G. A. (1948.) **Baby pig disease.**—*J. Amer. vet. med. Ass.* **112.** 121–123. **549**

The condition referred to is a highly fatal disease of new-born piglets; diarrhoea appears within a few hours of birth and death commonly occurs between the third and fifth day.

The cause of the condition is unknown; various theories are discussed. It is suggested that it is due to what is called a reversed anaphylactic shock. [See preceding abst.]

Swine fever was considered as a possible antigen in this anaphylactic syndrome. By injecting swine fever virus into eight immune sows three to five weeks from the end of gestation a mild type of baby pig disease was apparently produced. Aujeszky's disease virus was used in a similar manner, but the results were not conclusive.—D. LUKE.

PHILLIPS, C. E., LONGFIELD, H. F., & MILTIMORE, J. E. (1948.) **Porcine infectious rhinitis experiments.**—*Canad. J. comp. Med.* **12.** 268–272. **550**

A piglet inoculated intranasally with material from the upper respiratory tract of infected pigs developed destruction of the turbinated structures. A filtrate of the material was innocuous, as were also cultures of certain bacteria that were tested. —R. GWATKIN.

FOOT, A. S., & THOMPSON, S. Y. (1947.) **Preventing anaemia in young pigs.**—*J. Minist. Agric., Lond.* **54.** 308–311. **551**

The effect of iron pyrophosphate in varying doses in powder or pill form or in solution was studied in preventing anaemia in young pigs. It was concluded that three doses, each containing 30 mg. of iron, given during the second week of life gave good protection against severe anaemia.

Young pigs were given large doses of reduced iron, up to 1,000 mg., without any apparent ill effect, whereas a dose of iron pyrophosphate containing 180 mg. of iron produced dullness and loss of appetite lasting about 24 hours. One or two doses of reduced iron varying from 300 mg. to 1,000 mg. given between the seventh and eleventh days of life had a favourable effect on the haemoglobin level, though in no case was the haemoglobin level at three weeks as high as that of pigs receiving six doses of 30 mg. iron as iron pyrophosphate. The weight gains in the reduced iron group were almost the same as in the group receiving iron pyrophosphate.—D. LUKE.

PLAZIKOWSKI, U. (1945.) Några ord om duvornas sjukdomar och deras bekämpande. En sammanställning. [**Diseases of pigeons and their control.**]—*Skand. VetTidskr.* **35.** 1–30. [English summary.] **552**

Following an introduction on pigeon rearing, hygiene and disease prevention, P. describes the diseases which commonly attack pigeons, stating the aetiology, symptoms and treatment of each condition.

Infectious diseases described are:– pigeon diphtheria, avian cholera, trichomoniasis, tuberculosis and paratyphoid (caused by *Salmonella enteritidis* and *S. breslau*). The importance of isolation of sick birds is stressed. Other diseases include thrush, hard crop, inflammation of proventriculus and intestines, coccidiosis, *Taenia crassula* and *Heterakis maculosa* infestation, vitamin deficiencies (A, B, C, D and E), *Syngamus trachea* infestation, aspergillosis, gout. Common parasitic diseases are:– foot scab (caused by *Cnemidocoptes mutans*), *Dermanyssus avium* and other avian louse infestations and feather parasites. Other ailments described are so-called wing paralysis caused by joint inflammation, boils on the feet, infectious rotator disease and eye inflammation.—F. E. W.

MORGAN, B. B. (Undated.) **Bird mortality. A detailed resume of many known bird diseases.** —*Passenger Pigeon.* **6.** 27–34. **553**

The author states that little is known concerning the causes of death among wild birds. He discusses the difficulties associated with the collection of accurate data and pleads for the co-operation of ornithologists to help in the work. The known infections and parasitic diseases of wild birds are listed.—D. LUKE.

SELIKOFF, I. J., & ROBITZEK, E. H. (1947.) **Gingival biopsy for the diagnosis of generalized amyloidosis.**—*Amer. J. Path.* **23.** 1099–1111. **554**

Gingival biopsy was done on 47 TB. human patients. Amyloid was demonstrated in 14 out of 18 on whom a clinical diagnosis of amyloidosis had been made; in two of the remaining four patients amyloidosis was discovered P.M. Gingival biopsy was negative in 21 patients considered free on clinical evidence and other tests. The third group consisted of eight patients suspected of amyloidosis which could not be proven. Five of these were positive on gingival biopsy.

It is apparent from these results that a negative biopsy does not rule out the presence of amyloidosis, but that this technique may demonstrate amyloid when other tests during life have failed. —L. M. MARKSON.

LUKE, D. (1947.) **An unusual specimen.**—*Vet. Rec.* **59.** 585–586. **555**

Seeds taken from muscle of an imported Australian sheep's carcass were identified at Kew as being either a species of *Stipa* or of *Aristida*, probably *Stipa*—the "spear", "corkscrew" or "needle" grasses, common in Australian sheep pastures. The author quotes from Maiden's "Manual of the grasses of New South Wales" concerning the damage caused to sheep by the seeds of *Stipa setacca*.—L. M. MARKSON.

See also absts. **543** (milk fever); **603** and **604** (animal reports); **611** (cardio-vascular studies: a monograph).

POISONS AND POISONING

ROSS, S. G. (1947.) **Preliminary report on fish poisoning at Fanning Island (Central Pacific).** —*Med. J. Aust.* Nov. 22nd. 617–621. [See also DACK, *V. B.* **13.** 412.] **556**

Cases of fish poisoning in man and in animals have been recorded at Fanning Island since 1945. Before that time ten varieties of fish, which have since produced poisoning, had been eaten without ill effects. The symptoms include gastro-enteritis and nervous disorders; case histories are given. Cats, dogs and domestic ducks fed on the fish developed the disease.

All the fish incriminated have been caught in areas where war material was dumped in 1945. This suggests that the plankton and algae on which the fish feed, contain a poisonous principle produced from the deteriorating dumped war material.

The agent responsible appears to be similar to aconitine, as this drug will produce symptoms very similar to those observed at Fanning Island but no evidence is given to indicate what was the poison.—N. WICKHAM.

HILL, W. R., & DAMIANI, C. R. (1946.) **Death following exposure to DDT. Report of a case.** —*New Engl. J. Med.* **235.** 897–899. [Abst. in *Bull. Hyg., Lond.* **22.** 261. (1947), copied *verbatim.*] **557**

A case in which death occurred twenty-five days following exposure to DDT—2, 2 *bis* (*p*-chlorophenyl)—1, 1, 1-trichorethane—is reported. The symptoms, which began in a previously healthy man within twenty-four hours after exposure, were similar to those already reported as due to DDT intoxication. The disease picture, both clinically and at biopsy, simulated that of periarteritis nodosa, and it is assumed that DDT possesses allergenic properties and should be included among other drugs that are believed to be capable of producing such a sensitizing reaction.

RATERA, E. L. (1947.) Nota sobre plantas toxicas para el ganado en la Republica Argentina. **[Poisonous plants in Argentina.]**—*Rev. Med. vet., B. Aires.* **29.** 693–697. **558**

R. claims that *Nierembergia grandiflora*, *Rhynchosia phaseoloides*, *R. minima*, *R. corydifolia* and *Hymenoxys tweedii* are dangerous when ingested by cattle (he does not give the evidence for these claims) and suggests that chemists and veterinarians should study the plants to gain more exact knowledge of their toxicity.—I. W. J.

RATERA, E. L. (1945.) Plantas toxicas para el ganado mas comunes en nuestros campos. **[Plants poisonous to livestock in Argentina.]**—*An. Soc. rur. argent.* **79.** 283–286. **559**

Animals kept in the locality in which they are reared recognize and avoid poisonous plants, or acquire immunity to them, but newcomers are apt to be killed by them, especially if they arrive tired and hungry. Such losses may often be avoided by rubbing their lips and noses with decoctions of the plants until blistering is produced, so that they will recognize the smell and associate it with blistering. The subject is complicated by the fact that some plants are harmless in one district but acquire toxic properties from the soil in others. They may also be harmless unless infected with parasitic fungi. Some are poisonous at certain stages of growth but harmless at others. The condition and age of the animals are also of importance.—R. MACGREGOR.

RATERA, E. L. (1945.) Algunas gramineas toxicas para el ganado. **[Grasses having toxic properties.]**—*An. Soc. rur. argent.* **79.** 287–292. **560**

There are over a thousand families of grasses on the Argentine pastures. Two lists of dangerous grasses are given; those that produce at some stage in their growth a cyanogenetic glucoside; and those that are dangerous only when infected with parasitic fungi. Most of the former can be cut at a safe period and made into silage but it is advisable to test for the presence of glucoside, which can be done locally before using them for this or other purposes. For the second group, it is recommended to sow seed only from a disease-free stock and to disinfect it before sowing. If fungi appear, at least six furrows are ploughed round the infected area or it is ploughed up entirely and a different crop is planted.

—R. MACGREGOR.

CAMPORI, A. S. (1945.) El "abrojo grande" es toxico para el cerdo. [*Xanthium cavallinessii*, **a plant poisonous for pigs.**]—*An. Soc. rur. argent.* **79.** 293–296. **561**

The burweed (*Xanthium cavallinessii*) is normally harmless and is sometimes fed to cattle, but its seeds are poisonous after they have sprouted while the cotyledons are still yellow and before they have reached the surface. After reaching the surface they lose their toxicity. The plant is harmful, therefore, only immediately after rain which starts the sprouting, but not after the sprouts have grown, and it affects only pigs that root up the seeds. The symptoms are shivering, stamping and muscular contractions, and death usually follows in 24 hours. In experiments 80 g. of the cotyledons proved fatal to piglets of 11 kg. The plant is an annual and so could be easily eradicated.—R. MACGREGOR.

RATERA, E. L. (1945.) Destruccion de las principales plantas toxicas para el ganado. **[Control of plants poisonous to livestock.]**—*An. Soc. rur. argent.* **79.** 299–304. **562**

Annual plants can usually be eradicated by cutting before flowering or before seeding is complete. Perennials are more troublesome, as cutting does not destroy rhizomes. It does, however, weaken them, and encourages the growth of creeping grasses which will choke the rhizomes when they attempt to sprout. This is the method recommended for Sorghum; *Baccharis coridifolia*, a composite; and *Nierembergia hippomanica*, *Solanaceae*. Others must be ploughed up or dug out by hand. Chemical spraying has not proved satisfactory and is too expensive to be practicable.

—R. MACGREGOR.

MCCARROLL, P. J. (1947.) **Photosensitization.** —*Vet. Rec.* **59.** 413–414. **563**

A case is described of a cow bought six weeks previously. Large areas of skin sloughing occurred from the shoulders to the root of the tail. The ears and parts of the head and eyelids were bare of hair and scaly, and the teats were slightly puffy and scaly. The conjunctival mucous membrane was jaundiced, but the temperature and appetite were normal.

The condition was diagnosed as photosensitization probably caused by some agent in clover, in which the grazing was very rich, and the subsequent action of June sunlight on weakly pigmented skin. Other cattle on the same pasture were not visibly affected.—U. F. RICHARDSON.

BROCKMANN, H. (1943.) Lichtkrankheiten durch fluoreszierende Pflanzenfarbstoffe. **[Photosensitization by fluorescent plant pigments.]**—*Forsch. Fortschr.* **19.** 299. [Abst. from abst. in *Dtsch. tierärztl. Wschr./Tierärztl. Rdsch.* **52/50.** 56. (1944).] **564**

A brief note with no new information.

—I. W. JENNINGS.

WATKINSON, G., & HILLIS, B. R. (1947.) **Photosensitivity to sunlight from use of prophylactic sulphonamides. Its relation to vaccination reactions.**—*Brit. med. J.* Oct. 18th. 609–611. **565**

Prophylactic sulphanilamide (2 g. per day for ten days) was given to 470 personnel in an R.A.F. station in an attempt to prevent streptococcal infections. A high incidence (34·6%) of photosensitization rashes occurred, due to a combination of three factors—the sun, vaccination against smallpox and the sulphanilamide. The highest incidence was found in men recently vaccinated against smallpox, occurring concurrently with the development of the pustular stage in the lesion at the site of inoculation, even though at that time the drug had been suspended. No rashes appeared in personnel in whom such vaccination had failed or was refused.—J. M. ROBSON.

PHARMACOLOGY AND GENERAL THERAPEUTICS

(For treatment of specific infections see under the appropriate disease)

TOMSKI, H. W. (1946.) **Pharmaco-therapeutic notebook.** pp. viii+280. London: Baillière, Tindall & Cox. Price 15s. **566**

The intention of the author has been to help the pharmacist in the collection of essential notes on various aspects of pharmaceutical practice, but the hope is expressed that the summarized and classified notes may aid the medical student and help the practitioner in selecting the most efficient, appropriate and least toxic material.

The therapeutic agents are grouped in alphabetical order under 25 section headings, also arranged alphabetically, and space is left at the end of each of the sections for additions. Each agent is clearly visible in larger type and the data include their general uses, suitable doses and their methods of preparation, together with some discussion on incompatibilities and stabilities.

The book does not set out to be complete but it is up to date, free from errors, well and clearly arranged and, in these stringent days, is clearly printed, well bound and reasonably priced. It is as likely to be as valuable to the general veterinary practitioner as to the pharmacists, medical students and practitioners specifically mentioned.

—MALCOLM WOODBINE.

I. EAGLE, H. (1947.) **The inactivation of penicillins F, G, K, and X by human and rabbit serum.**—*J. exp. Med.* **85.** 141–161. **567**

II. EAGLE, H. (1947.) **The varying blood levels afforded by penicillin F, G, K, and X in rabbits and man.**—*Ibid.* 163–173. **568**

III. EAGLE, H. (1947.) **The therapeutic activity of penicillins F, G, K, and X in experimental infections with pneumococcus type I and streptococcus pyogenes.**—*Ibid.* 175–186. [Author's summaries copied *verbatim.*] **569**

I. Penicillins F, G, K, and X were all inactivated by human and rabbit serum, but two qualitatively distinct mechanisms were apparently involved. One was a slow inactivation of all four penicillins by a relatively thermostable serum component which was not demonstrably affected by heating for 60 minutes at 56°C. In both human and rabbit serum this general inactivation of penicillin behaved like a pseudo first order reaction, with a velocity constant of 0·05–0·07 for penicillin X, and 0·09–0·11 for penicillins F and G. The percentage of penicillins F, G, and X inactivated per hour was independent of their concentration over the range 0·4 to 50 micrograms per c.c., averaging 9·5, 10, and 6·5 per cent, respectively, in human serum, and 9, 8·5 and 5 per cent in rabbit serum. The rate of inactivation varied linearly with the concentration of the serum factor. Penicillin X was consistently and significantly less susceptible to inactivation than any of the other penicillins. Although minor differences were observed between F and G, these were not consistent, and are of questionable significance.

Superimposed on this slow inactivation of penicillins F, G, K, and X by a thermostable serum component was a much faster inactivation observed only with penicillin K. In both rabbit and human serum, the serum factor responsible for this inactivation was highly thermolabile, and was almost completely destroyed within 5 minutes at 56°C., leaving only a thermostable component, not affected by further heating. The inactivation of K by this thermolabile component was not a first order reaction, but varied with the concentration of both serum and penicillin. At high concentrations of K, the rate of inactivation due to the thermolabile factor was negligible, and penicillin K was destroyed no more rapidly than F, G, or X. The rate of inactivation increased as the concentration of penicillin was reduced. At penicillin K concentrations of 50, 10, 2, and 0·4 micrograms per cc., the hourly destruction in rabbit serum averaged 10, 16, 21, and 54 per cent. The corresponding figures in human serum were 10, 11, 14, and 54 per cent. The reservations entailed by the large serum error at the lower concentrations of penicillin are discussed in the text.

The temperature coefficient for the inactivation of penicillin K by fresh human or rabbit serum was 2·5 for each 10°C. No significant inactivation was observed in 24 hours at 20°C.; and this was true also of penicillins F, G, and X. Heparinized plasma was just as active as serum, washed red blood cells had no effect, and the activity of whole blood was referable to its plasma content. The nature of the serum factors responsible for these two types of penicillin inactivation are under present study. The urinary excretion of penicillin is so rapid that the slow destruction of penicillins F, G, and X in the circulating blood as here described is of secondary significance therapeutically. It nevertheless must contribute to their rapid disappearance from the blood; and the fact that X is inactivated more slowly than either F or G could be reflected in higher and more sustained blood levels than are afforded by the latter two species. There are some reports that such is the case, and the following paper provides further evidence for the superiority of penicillin X in this respect over the other species so far studied.

The serum inactivation of penicillin K, at a rate which increases as its concentration falls, should be reflected in significantly lower and more evanescent blood levels than are observed with penicillins F, G, or X. As will be discussed in the following paper, this has been found to be the case, and provides a simple explanation for its paradoxically low therapeutic activity *in vivo*.

II. In both man and rabbit, penicillin X provided higher and more sustained blood levels than did penicillins F or G similarly administered in equal dosage (0·6 mg. per kg.); while penicillin K gave lower and evanescent levels. One hour after intramuscular injection, the blood levels in rabbits averaged 0·11, 0·18, 0·02, and 0·33 for F, G, K, and X, respectively; and levels of 0·1 mg.

per kg. were sustained for 1, 1·4, 0·5, and 2·1 hours, respectively. In man, the blood levels of G, K, and X averaged 0·23, 0·16, and 0·37 mg. per kg. 1 hour after intramuscular injections at 0·6 mg. per kg., and 0·11, 0·02, and 0·15 mg. per kg. 1 hour after intravenous injection. In man, a level of 0·1 microgram per cc. was sustained for 1·6, 1·2, and 2·3 hours after the intramuscular injection of G, K, and X, respectively, and for 1, 0·5, and 1·3 hours after their intravenous injection. The total urinary recovery of penicillins F, G, and X varied between 68 and 100 per cent, averaging 61, 87, and 74 per cent, respectively, in rabbits. In man the urinary recovery of G and X averaged 86 and 93 per cent, respectively. In sharp contrast, the urinary recovery of penicillin K averaged 33 per cent in seven rabbits and 28 per cent in six human volunteers. The major portion of the penicillin appeared in the first 30 to 60 minutes. This suggests a rapid inactivation of penicillin K *in vivo*. The therapeutic significance of these data is discussed in the text, and in greater detail in the following paper.

III. The relative bactericidal activities of penicillins F, G, K, and X against Type I pneumococcus *in vitro* were 60, 100, 180, and 135. The corresponding activities against *Streptococcus pyogenes*, strain C-203, were 75, 100, 115, and 145, respectively. The total curative doses (CD_{50}) of penicillins F, G, K and X in pneumococcal infections of white mice (ten injections at 3 hour intervals) were 4·6, 3·8, 20, and 2·4 mg. per kg., respectively, or relative activities of 83, 100, 19, and 160, referred to G as 100.

The corresponding curative doses in streptococcal infections of white mice were 2·6, 1·3, 14·0, and 0·5 mg. per kg., or relative activities of 50, 100, 9, and 260. Penicillin K was therefore one-tenth as active *in vivo* as would be implied by its bactericidal activity *in vitro*. This probably reflects its rapid inactivation *in vivo* evidenced by the low and evanescent blood levels observed in both rabbits and man, and the low urinary recovery of this species of penicillin. Penicillin X was significantly more active therapeutically than its bactericidal activity *in vitro* would imply. This probably reflects its slower inactivation *in vivo*, evidenced by the somewhat higher and more prolonged blood levels afforded by this penicillin in comparison with penicillin G. Judged by the mouse infections with the strains here used, penicillin X is the penicillin of choice in the treatment of infections with pneumococcus Type I and hemolytic streptococci.

The curative dose of penicillin in streptococcal and pneumococcal infections paralleled the varying susceptibility of these organisms to penicillin *in vitro*.

POMMER, A. (1947.) Einfluss der Röntgenstrahlen-Qualität und -Intensität sowie der Bestrahlungsmethode auf die Toleranzdosis der Haut bei Pferden. **[Influence of the quality, intensity and method of radiating X-rays on the tolerance dosage of the skin of horses.]**—*Wien. tierärztl. Mschr.* **34.** 676–699. **570**

Investigations were carried out on two horses to determine first, the effects of single short-period radiation with a hard, intense ray and second, the effects of fractional radiation in dosages of 300 r. at one day intervals with rays of the same hardness and intensity, to the same total dosage. The radiation was at 180 kV, 6 mA at a focal distance of 50 cm. with an intensity of 40·6 r. per min. at the skin surface.

The total dosage in each case was varied in eight stages from 900–3,000 r. Single doses were tolerated up to 1,800 r. but higher values produced bullous dermatitis after an interval of 44 days, followed after 63 days by gangrenous dermatitis and accompanied by deep permanent lesions in tissue and muscle. Fractional doses caused only depilation. Large therapeutic dosages can therefore safely be administered fractionally.—E. V. L.

ERNST, A. M. (1946.) Rad. sarsaparillae als geneesmiddel bij uraemia. **[Sarsaparilla as therapeutic for uraemia.]**—*Tijdschr. Diergeneesk.* **71.** 271–282. [English, and French summaries.] **571**

In 1930 RITTMANN & SCHNEIDER reported that the administration of sarsaparilla rods lowers the urea content of the blood of patients with uraemia, but no notice was taken of this finding until E. re-investigated the matter. Three-quarter-total nephrectomy was carried out in four experimental dogs fed a diet giving a high urea excretion of up to 225 mg. per 100 ml. Oral treatment with sarsaparilla reduced the urea to a normal figure. Four dogs affected with chronic nephritis from leptospirosis were also treated and although the urine urea was very high (up to 445 mg. %) success was achieved in each case by the same treatment. With the material available the daily dose used was 0·5–1·0 g. per kg.

Sarsaparilla does not act by accelerating the excretion rate of urea, nor is it a simple diuretic; the metabolism of protein appears to be altered so that the amount of urea formed and excreted as such is reduced.—J. E.

BROWN, E. A., KRABEK, W., & SKIFFINGTON, R. (1947.) **Glycerite of hydrogen peroxide. I. Comparison of its bacteriotoxic action with that of mercurial solutions.**—*J. Bact.* **53.** 793–799. [Authors' summary copied *verbatim*.] **572**

When tested by a modified cylinder plate method, peroxide-glycerol solutions, made from

either urea peroxide or hydrogen peroxide, showed a bacteriotoxic action on both gram-positive and gram-negative organisms.

A greater bactericidal effect was noted with gram-positive than with gram-negative bacteria.

The presence of 8-hydroxyquinoline in the peroxide solution did not appear to improve significantly the bacteriotoxic action of the solution in the absence of serum, but did appear to enhance the activity in the presence of 10 per cent horse serum.

In comparison with 12 mercurial solutions, the glycerol-peroxide solutions showed, in general, greater bacteriotoxic action on gram-positive organisms than did the mercurial solutions. The latter were, in general, the more effective on gram-negative bacteria. In specific cases, however, the peroxide-glycerol solutions were more efficacious than some of the mercurial solutions, particularly when water was the principal solvent for the mercurial compound.

EAGLE, H., & FLEISCHMAN, R. (1948.) **Therapeutic activity of bacitracin in rabbit syphilis, and its synergistic action with penicillin.**—*Proc. Soc. exp. Biol., N.Y.* **68.** 415–417. **573**

An intramuscular dose of 2,300 units per kg. of bacitracin [an antibiotic derived from certain strains of *Bacillus subtilis*] in aqueous solution daily for four days cured syphilis in approximately half the rabbits tested. Cure was evaluated by lymph node transfer to normal animals 4–6 months after treatment. A marked synergism with penicillin was reported. As little as 1 mg. per kg. penicillin (one-fortieth of CD_{50}) and 1,280 units per kg. bacitracin were curative if injected into the thigh muscles of opposite legs within a minute of each other.—N. DEAN.

See also absts. **391** (anatoxins); **440** and **441** (leishmaniasis); **444** (trichomoniasis); **446** (BAL and trichomoniasis); **448** (blackhead); **505** and **506** (mange); **532** (cancer); **539** (paralysis in dogs); **565** (sulphonamides and photosensitization); **595** (sterility in sows).

PHYSIOLOGY, ANATOMY AND BIOCHEMISTRY

LEA, D. E. [M.A., Ph.D., Prophit Student of the Royal College of Surgeons]. (1946.) **Actions of radiations on living cells.** pp. xii+402. 61 figs., 83 tables. Cambridge: University Press. 8vo. 21s. **574**

Much work has been done recently on the effects of various types of radiations on tissues, and the introduction of radio-active substances for diagnostic and therapeutic purposes, as well as for many types of scientific investigations, makes this work of additional importance. The author gives a reasonably simple account which opens with chapters dealing with the physical and chemical effects of ionizing radiations and a discussion of how these properties might explain their effects on enzymes and living cells. There follows discussion of the effects of radiations on viruses, and on the chromosomes and genes of the cell nucleus. Lastly, the possible mechanisms by which radiations produce their lethal effect are discussed. In a book of this type it is always difficult, as the author emphasizes, to decide what background of knowledge the reader possesses, but in this case a happy mean has certainly been struck. For example, the chapter on the genetic effects of radiation is preceded by a description of the mechanism of heredity, the nature of genes and mutations and the structure of chromosomes, which make the subsequent discussion easy to follow. This book can be recommended not only to those who want to read about the subject, but also as a constant source of reference.—J. M. R.

DERIVAUX, J. (1942.) Protéines sanguines et rapport albumines/globulines chez les chevaux, les bovidés et les chiens normaux. **[Blood proteins and albumin-globulin relations in normal horses, cattle and dogs.]**—*Acta biol. belg.* **2.** 295–297. **575**

Using de Piettre's gravimetric method, the blood protein and blood albumin : globulin ratios were determined for 14 horses (ages six months to 17 years), 13 cattle (2–7 years), and 11 dogs of variable age. All animals were normal and the determinations were made on serum samples which had been kept in the refrigerator for not more than 48 hours.

The minimum, maximum and average values obtained were respectively, (1) total protein :– horse, 6·57, 8·59, 7·73%; cattle, 7·70 8·26, 7·85%; dog, 6·58, 8·55, 7·38%. (2) albumin :– horse, 2·47, 4·37, 3·39%; cattle, 2·87, 3·98, 3·48%; dog, 3·92, 5·43, 4·56%. (3) globulin :– horse, 3·46, 5·13, 4·34%; cattle, 3·94, 4·89, 4·36%; dog, 2·52, 3·13, 2·82%. (4) albumin : globulin ratio :– horse, 0·53, 1·13, 0·78%; cattle:– 0·59, 0·97, 0·80%; dog, 1·34, 1·85, 1·58%. No estimate of the standard deviations of these values is given, and individual results are not listed.

The author concludes that his results confirm those of other workers in that there exists a fairly constant total blood protein, regardless of species and a blood albumin : globulin ratio which is a species characteristic.—J. T. ABRAMS.

FOURIE, J. M., & DEACON, E. A. (1947.) **Inorganic phosphorus in the blood of cattle in relation to age.**—*J. S. Afr. vet. med. Ass.* **18.** 101–104. **576**

The authors, working in the veterinary

research laboratory at Vryburg, found that the blood phosphorus content of cattle of both sexes gradually diminishes as the animals grow older, varying from about 6 mg. %, in calves 6–9 months old, to about 4 mg. %, in animals over four years, at which level it remained constant. On statistical analysis of the data obtained, in both males and females, this decrease in blood inorganic phosphorus content with increasing age was found to be significant.—MALCOLM WOODBINE.

AUSTIN, C. R. (1948.) **Number of sperms required for fertilization. [Correspondence.]**—*Nature, Lond.* **162.** 534–535. **577**

In rabbits and rats a proportion of tubal ova are fertilized even though still surrounded by cumulus cells. These results are in contrast to previous findings that in many species of mammals denudation of the egg by hyaluronidase is necessary before spermatozoa can penetrate.

Spermatozoa counts of the washings from the fallopian tubes of artificially inseminated rabbits ranged from 2,000–4,000. Similar counts from the tubes of rats varied from 9–101 with a mean of 43. The number of animals used is not stated.

A. concluded that fertilization was possible in the rabbit when less than one thousand spermatozoa reached the vicinity of the eggs and in the rat less than one hundred spermatozoa.

—E. J. H. FORD.

LARDY, H. A., HANSEN, R. G., & PHILLIPS, P. H. (1945.) **The metabolism of bovine epididymal spermatozoa.**—*Arch. Biochem.* **6.** 41–51. **578**

The metabolism of epididymal spermatozoa of bulls was investigated under a variety of conditions and is discussed in relation to the utilization of energy for motility. On removal from the epididymis, movement was initiated by aeration and could be inhibited by cyanide. The oxidation of cellular phospholipoid resulted in the esterification of inorganic phosphate to produce adenosine triphosphate. Storage of excised epididymes in the refrigerator for two days increased the respiration of their contained spermatozoa, an effect which may be related to the ripening of the gametes.—T. H. FRENCH.

CHANG, M. C. (1947.) **Effects of testis hyaluronidase and seminal fluids on the fertilizing capacity of rabbit spermatozoa.**—*Proc. Soc. exp. Biol., N.Y.* **66.** 51–54. **579**

After a brief review of the action of hyaluronidase in fertilization C. described experiments designed to compare the effects of testis hyaluronidase, seminal hyaluronidase and seminal fluid from a vasectomized male rabbit.

The semen of a male rabbit was collected with an artificial vagina and diluted 1 : 1,000 with normal saline. The spermatozoa concentration was adjusted so that 0·5 ml. contained a minimal effective number of spermatozoa.

Thirty-three adult non-pregnant doe rabbits were divided into three groups and each doe inseminated with 0·5 ml. of diluted semen to which had been added one of the following :– 0·5 ml. saline containing bull testicle hyaluronidase, 0·5 ml. heated normal semen or 0·5 ml. semen from a vasectomized male.

Thirty-two control does were inseminated with a minimal effective number of spermatozoa in saline only. Soon after insemination superovulation was induced; the rabbits were killed 25–30 hours later and fertilized and unfertilized ova counted.

The results are given in tabular form. The number of fertilized ova in the testis hyaluronidase group was not significantly greater than in the corresponding controls, nor was the average percentage of fertilized ova in the semen hyaluronidase group significantly greater than in the corresponding controls although the total of fertilized ova in this group was higher than in the controls.

In the semen without hyaluronidase group the difference between the average percentage of fertilized ova in experimental does and controls was statistically significant and the total of fertilized ova was greater in the experimental group than in the controls.

The deduction is that the added hyaluronidase, whether from testis or semen, did not increase the fertilizing power of the spermatozoa but that some factor present in the semen is important.

—E. J. H. FORD.

KAR, A. B. (1947.) **On the development of an occluding plate in the oviduct of the domestic fowl and on certain points in the development of the oviduct.**—*Poult. Sci.* **26.** 262–271. **580**

The development of the müllerian duct from 4–72 days is described. When first joined to the cloaca its opening is barred by an occluding plate. The course of the duct in relation to the wolffian duct is also described.—REGINALD A. GREEN.

GREEN, D. E. [Edited by] (1946.) **Currents in biochemical research.** pp. viii + 486. Numerous figs. and tables. New York: Interscience Publishers. **581**

Biochemistry has made very rapid strides in recent years and has helped tremendously in the advance of allied sciences and this is well reflected in the series of essays and discussions collected in this book, which cover many fields of biological research. All the examples are interesting and in some of them the material is presented in a really fascinating manner. GREEN, the editor of the book, discusses biochemistry from the standpoint of enzymes with particular references to substances, such as vitamins, which produce biological effects

in minute amounts. He propounds the view that "Any substance which in trace amounts induces profound biological effects does so either by participating in or by specifically affecting some enzyme systems". As he truly says this theory, if valid, must be regarded as one of the cornerstones of the science of pharmacology. Houssay begins his discussion of the hormones by differentiating them from other important substances which also reach the circulating fluids. The steroid hormones are dealt with by Pincus. Some aspects of biochemical antagonism, so important in the development of chemotherapy, are discussed by Woolley who has himself made valuable contributions to this subject. The use of the isotope technique in the study of intermediate metabolism is described by Rittenberg and Shemin. Other subjects dealt with are the gene, viruses and fundamentals of oxidation and reduction. The value of biochemistry in immunology is well illustrated by the article by Heidelberger. The discussions are on the whole simple and straightforward.

There is no question that this book is of interest to anyone concerned with the advance of biological knowledge.—J. M. ROBSON.

See also absts. **606** (the physiology of domestic animals: a textbook); **610** (hormones and behaviour: a textbook).

PUBLIC HEALTH, VETERINARY SERVICES AND VETERINARY EDUCATION

LOUIS, A. (1946.) Production et contrôle hygiénique du lait dans les étables urbaines et suburbaines. **[The production and hygienic control of milk in urban and suburban dairies.]** *Lait.* **26.** 2–16, 125–142, & 221–235. **582**

LOUIS, A. (1947.) Production et contrôle hygiénique du lait dans les étables urbaines et suburbaines. **[Production and hygienic control of milk in urban and suburban dairies.]**—*Ibid.* **27.** 48–67. **583**

The rules for hygienic milk production are described on conventional lines under the following general headings: hygiene of premises, health of cattle, hygiene of personnel, of utensils, of milking, and the treatment and control of milk before sale.—R. MACGREGOR.

KAY, H. D. (1947.) **Presidential address on the compositional quality of milk.**—*J. R. sanit. Inst.* **67.** 515–518. Discussion pp. 534–535. **584**

During recent years the nutritional quality of milk has declined, chiefly in non-fatty solids, particularly in the northern parts of England. ROWLAND found that from January to April 1941 for weeks at a time the non-fatty solids content of entire bulked milk of some milk collecting depots was below 8·5%, but that in late April or early May, as soon as the cows obtained sufficient young grass, the percentage rose rapidly.

The general decline is largely due to dairy farmers' practice of breeding for volume only. For several years the number of Friesian bulls licensed has steadily increased, many of them being from low-quality milk producing strains. It is cheaper to produce poor quality milk because the quantity of food needed per gal. is less, but, except for a small quantity from the Channel Island breeds the price received is the same for all milk irrespective of variations in compositional quality.

The effect of mastitis on the composition of the bulk milk of commercial herds is very small. The winter fall in quantity was found to be due to underfeeding, owing to the shortage of imported concentrates and the low quality of hay.

To improve the position, milk should be paid for on its compositional quality; producers of milk persistently below the legal standard should be prosecuted, whether the milk is genuine or not; bulls whose ancestors gave low-quality milk should be eliminated; and increased quantities of concentrates should be imported.

In the discussion LING said that 63% of hay samples analysed at Seale-Hayne Agricultural College had less than 10% crude protein in the dry matter.—J. O. L. KING.

BUTTIAUX, R., & LESNE, L. (1947.) L'analyse bactériologique des laits concentrés sucrés. Présence de staphylocoques pathogènes dans certains d'entre eux. **[Bacteriological examination of sweetened condensed milk. Presence of pathogenic staphylococci.]**—*Lait.* **27.** 121–131. **585**

Owing to outbreaks of enteritis in infants' schools and orphanages, 20 samples of sweetened condensed milk were examined. Pathogenic staphylococci were demonstrated in 14, of which three were *Staph. albus.* The strains were all thermoresistant up to 63°C. Contamination was thought to have occurred during manufacture.

—R. MACGREGOR.

PATRIZI, F. (1947.) L'esame anatomo-patologico e l'esame batteriologico nell'ispezione delle carni. **[Pathological and bacteriological examination of carcasses in meat inspection.]**—*Zooprofilassi.* **2.** No. 2. 3–12. **586**

From 1932–47 bacterial examinations were made, in Macerata (in the province of Marchés, Italy) of 1,655 specimens of meat for human food, submitted by inspectors from cases of emergency slaughter of sick animals. 1% of the specimens were infected with salmonella and 26% with non-specified bacteria. Distinct changes were usually visible in the meat, but in 20% of the

specimens in which changes were observable no pathogenic bacteria were demonstrable. In 6% of the pork and 1% of the beef and veal salmonella organisms were found without visible signs of infection.

General instructions are given for action to be taken according to the circumstances and emphasis is placed on the value of using bacteriological methods as a routine measure.

—R. MACGREGOR.

LOTTI, L. (1947.) Sulla destinazione delle carni di suini pestosi. **[Disposal of meat infected with swine fever.]**—*Zooprofilassi.* **2.** No. 9. 19–21. **587**

In view of the prevalence of swine fever in Italy in the immediate post-war period the question of the disposal of meat from infected carcasses was given attention. L. considers that it may be used for human consumption provided it is cooked under supervision at the abattoir, as is done in the manufacture of certain forms of salami sausage.

There is some discussion concerning bacteria, particularly salmonella organisms that occur in swine fever-infected carcasses.—R. MACGREGOR.

POSTEMA, J. L. (1942.) Laboratorium-methoden ter ondersteuning van het organoleptisch onderzoek van vleesch. **[Laboratory support for the organoleptic examination of meat.]**—*Tijdschr. Diergeneesk.* **69.** 430–445. [English, French and German summaries: abst. from English summary.] **588**

The various laboratory tests which may be used in the detection of "tainting" in meat at abattoirs are discussed. It is considered that the most useful tests are the chemical ones for ammonia and hydrogen sulphide and the microscopic examination of stained smears for bacteria. The estimation of the pH reaction is a useful confirmatory test. The viscosity test applied to a broth prepared from the suspected meat is of value in examination of beef or pork from emergency-slaughtered animals. The technique of these tests is described.

ANON. (1947.) **Inoculation risks. Legal liability of veterinary surgeons providing and using defective materials.**—*Vet. Rec.* **59.** 126–127. **589**

The case of Dodd *v.* Wilson & McWilliam is of considerable importance to the veterinary surgeon. Thus the professional man is not immune from the "implied" warranty which accompanies the sale of goods. In law, the veterinary surgeon is liable, if it can be proved that the material he used was not reasonably fit for the purpose for which it was employed, despite the fact that he is not expected to be able to verify the contents of the material. In this case, a *Corynebacterium* toxoid is said to have contained unneutralized toxins.

Whilst the veterinary surgeon would normally claim indemnity from the suppliers, a better protection would be afforded by insuring against the liability.—G. V. LAUGIER.

ANON. (1947.) **Sequel to inoculation against *Corynebacterium pyogenes* (summer) mastitis. Full text of Mr. Justice Hallett's judgment in the Chester case.**—*Vet. Rec.* **59.** 55–61. **590**

This is the judgment of a case which lasted four days, when two farmers claimed heavy damages from a firm of veterinary surgeons for the loss through inoculation of cows and heifers in their herd with an alleged poisonous toxoid as a preventive against summer mastitis, alleging breach of contract by the suppliers of the toxoid, the manufacturers being also included as third and fourth parties respectively. All the cattle which had been inoculated with a certain batch of the toxoid became affected; other animals, inoculated at the same time, but with different batches, were unaffected. The symptoms developed within half to three-quarters of an hour, consisting of grunting, panting, protrusion of the tongue in some, passage of blood in others and ultimate development of diarrhoea in some cases. Three cows died, 24 calves were lost as a result of abortion or soon after birth, and there was considerable depreciation of the surviving stock together with a loss in milk yield.

The inoculation could have caused the condition in three ways, (1) the toxoid might have contained living bacteria; this was considered unlikely; (2) the toxin might not have been completely toxoided; (3) the condition might have been anaphylactic shock.

In regard to preparation of toxoid, one criticism made by expert witness called for the plaintiffs was that a nitrogen estimation should have been carried out to determine the exact quantity of formalin required for complete detoxication. Apart from this criticism the preparation of the toxoid was found satisfactory. Toxicity tests carried out later by an expert witness showed no ill effects but this was to be expected after a lapse of two months when sufficient time was given for the formalin to act. In the same way detoxication should have been complete by the time the cows were injected. It was considered that there were strong grounds for doubting whether the toxoid was toxic at the time of administration. It was considered that the time which elapsed before the appearance of symptoms, *i.e.*, half to three-quarters of an hour, and also the fact that all 60 animals inoculated with this particular batch had been affected, indicated that

the cause was not anaphylactic shock. The evidence did not show satisfactorily that sensitization of such a large number of animals was likely, as there was nothing to suggest some common factor which could have sensitized all the cattle concerned, either by previous inoculation, feeding or blood relationships. The court was convinced that the condition was caused by "something wrong in the toxoid and not by something wrong in the cattle".

The plaintiffs rested their claim against the defendants upon an alleged express warranty, or alternatively, an alleged implied warranty. There was no claim of negligence against the defendants. An alleged express warranty was based on a conversation in which the defendants advised the use of the toxoid saying it could do no harm. This was regarded as part of the professional advice given by defendants to the plaintiffs but was not intended to have contractual effect, and the claim in so far as it was based on expressed warranty would fail. After reviewing the legal position of the subject the court concluded that in this case it was an implied condition of the contract between plaintiffs and defendants that the substance used would be reasonably fit for use, and that therefore the plaintiffs could recover damages against the defendants and the defendants in turn could recover from the third parties and fourth parties respectively what they had to pay.—B. W.

ANON. (1947.) **Veterinary Services Policy. Farmer-controlled clubs to be encouraged.**—*N.Z. J. Agric.* **75.** 249 & 251. **591**

This is a statement of the policy concerning the formation and administration of Veterinary Clubs adopted by the Veterinary Services Council set up under the New Zealand Veterinary Services Act, 1946. The Council states its intention of fostering the formation of Veterinary Clubs controlled by farmers and staffed by salaried veterinarians wherever this can be done without injuring veterinarians who were practising prior to the passing of the Act. There are clear statements of policy concerning initial formation of Clubs, co-ordination of Clubs by Regional Executives, salary scales, subsidies to Clubs and refunds and payments in respect of veterinary services to livestock owners not members of Veterinary Clubs. [A short note on the New Zealand Veterinary Services Act and the steps which led to its passing appeared in *Aust. vet. J.* **23.** 100–101 (1947); for further references, see *V. B.* **18.** 224.]

—J. F. FILMER.

ANON. (1946.) **Editorial [world health organization].**—*Bull. Hlth Org. L.o.N.* **12.** 299–300. **592**

The dissolution of the League of Nations in 1946 might have involved the total disappearance of the *Bulletin of the Health Organisation*, but a new institution has been set up within the framework of the United Nations. In February, 1946, the Economic and Social Council of the United Nations called an International Health conference. This drew up the constitution of the World Health Organization, defining its objective as the attainment by all peoples of the highest possible level of health. Membership is open to all states. The conference, which met in New York, was attended by 51 countries and ten international health organizations. The final act resuming the work of the conference was signed by 61 countries, including all the United Nations. The title of the periodical under the health committees remains *Bulletin of the Health Organisation.*

—D. S. RABAGLIATI.

See also absts. **389** and **390** (food poisoning); **394** (milk-borne scarlatina); **395** (streptococcal food poisoning); **412** (salmonellosis).

REPRODUCTION AND REPRODUCTIVE DISORDERS

DANKS, A. G., KLUSSENDORF, R. C., HAMILTON, J. G., HENDERSON, J. A., & RAMGE, J. C. (1947.) **Panel discussion on artificial insemination of cows.**—*J. Amer. vet. med. Ass.* **110.** 161–169. **593**

Report of a meeting at which opening addresses were given by three speakers, followed by a series of 66 specific and unrelated questions. The object of the meeting was to discuss the part to be played by practitioners in artificial insemination. The profession was generally lacking in enthusiasm and had neglected this field so that it had become dominated by laymen. The speakers recommend the practitioner as the ideal veterinarian for this work, suggesting that it enhances prestige, technical skill in reproductive manipulations, and brings the practitioner into close touch with the herd as such. The work requires one assistant for every 1,000 cows, the cost to the farmer being from $5 to $8 per cow. It was stressed that circuits worked by laymen under the supervision of practitioners were usually failures since laymen were difficult to control and the practitioner tended to lose touch with the everyday problems. The remaining questions concerned the instruction of practitioners on small points of technique, or of finance.—R. J. F.

ROWSON, L. E. A. (1947.) **Collection of semen by means of the urethral fistula.**—*Vet. Rec.* **59.** 289–291. **594**

Conditions exist under which bulls may refuse to serve into artificial vaginas although natural

service is not affected. R. describes a method for collecting semen which obviates the use of an artificial vagina. A urethral fistula is created between the sigmoid flexure of the penis and the anus, and a special cannula inserted. Details of the operation are given.

The cannula, which is "J" shaped with the curved arm leading to the exterior, is described with diagrams but no measurements are given. A device is incorporated which closes the aperture of the cannula so that urine flows normally. Samples of semen obtained were excellent but sometimes there was contamination with urine and blood. The difficulties of cleaning the cannula, its chronic irritant effect, and the possibility of creating an ascending infection of the urinary tract are discussed.—R. J. FITZPATRICK.

THIESS, J. (1943.) Beitrag zur Behandlung steriler weiblicher Schweine mit "Enoulan, Hormal und Pregnyl". **[The treatment of sterile sows with "enoulan", "hormal" and "pregnyl".**—*Wien. tierärztl. Mschr.* **34.** 44–45. (1947.) **595**

Ten anoestrous sows were treated with pregnyl (anterior pituitary hormone) and resumed oestrous activity as a result. Nineteen sows with normal oestrus but which failed repeatedly to conceive were treated with enoulan or hormal (Vitamin E preparations), injected intramuscularly a few hours after service and the majority became pregnant.—J. E.

STURKIE, P. D. (1946.) **The effects of hypothermia upon the reproductive tract of the hen.** —*Poult. Sci.* **25.** 369–372. **596**

The body temperature of White Leghorns was artificially lowered to 83–102°F. After this treatment 105 hens laid hard-shelled eggs and 67 laid soft-shelled eggs. Most of those with an egg in the uterus while hypothermic laid soft-shelled eggs. If normal temperature was regained before the egg entered the uterus, it was hard-shelled. The time of laying of the hard-shelled eggs was delayed. Hypothermia did not interfere with ovulation.—R. A. GREEN.

PANYSHEVA, L. V. (1940.) **[Artificial insemination of sheep with a small quantity of diluted semen.]**—*Iskusst. Osemen. sel'khoz. Zhivotn.* **1.** 296–299. **597**

Causasian merino sheep were inseminated with the semen of rams of the Lincoln and Romney Marsh breeds. Three different diluents were used :– NaCl, GFO-2, in ampoules [? a mixture of glucose and di-sodium phosphate] and Na_2SO_4-1·6% solution. Groups of sheep were inseminated with undiluted semen, with similar semen diluted 1 : 1 with one or other of the diluents or with similar semen diluted 1 : 2, the amount used being 0·05 ml. The average concentration of spermatozoa in 1 ml. of undiluted semen was 2,500 millions.

Dilution with 1·6% Na_2SO_4 gave the best results. With undiluted semen 82% became pregnant and 84% and 86% with samples of semen diluted with Na_2SO_4 solution 1 : 1.

CONN, E. (1946.) **Management of bulls.**—*Vet. Rec.* **58.** 610–611. **598**

C. argues that better hygiene, feeding and handling will improve bulls and he extends the argument to imply that good environment will improve genetic constitution.

C. suggests for housing, a box 14 feet square with exercising pen. Some details of construction and fittings are given. Half to one hour's exercise is recommended for older bulls and improved semen quality as well as more vigorous service is said to result; methods for exercising are discussed.

In addition to restricted grazing or hay and green foods, concentrates such as oats, linseed, beans, fishmeal, meat and bone meal, and dried milk are necessary, especially during winter.

Psychological factors are mentioned, such as the great danger of impressing on the bull's mind an association between rough handling and service. If service has been impaired by such a complex, drastic changes of environment may restore it. There is great need for patience when educating young bulls to service. A limit of one service per week until the bull is two years old is advised. Abnormal temperaments are divided into nervous, sulky and treacherous, and advice for dealing with each is briefly given.—R. J. FITZPATRICK.

GUTERMAN, H. S. (1947.) **Influence of arginine on oligospermia.**—*Proc. Soc. exp. Biol., N.Y.* **65.** 176–178. **599**

Out of 23 human patients with oligospermia of unknown origin 18 received daily 1·8–2·7 g. arginine and 40–60 mg. each of lysine, pyroxidine and tryptophane for a period of eight months. Five patients received no treatment.

Spermatozoa counts rose in both treated and untreated patients but in neither case reached normal levels. Two pregnancies occurred in wives of men in the untreated group but none in the treated group.

G. states that SHETTLE (1942) administered arginine which relieved cases of oligospermia produced by an arginine-deficient diet, whereas in the present series clinical cases with no history of arginine deficiency did not respond.

—E. J. H. FORD.

DRY, F. W., FRASER, A. S., & WRIGHT, G. M. (1947.) **Mendelian inheritance in New Zealand Romney sheep. [Correspondence.]**—*Nature, Lond.* **160.** 646. **600**

The genetics of strains of " N-type " sheep in New Zealand are discussed. " N-type " sheep have many halo-hairs in the coat of the lamb at birth and have usually hairy fleeces. Four strains of these sheep have been studied. The N gene in some strains is dominant, but in heterozygotes its expression is influenced by modifiers. There is also a recessive N and the problem of the relation between these has not yet been solved. The hypothesis formerly held was that the dominant N was a duplication of the recessive N, but breeding experiments indicate that these genes are independent. The authors have evidence which makes them speculate whether the two genes, although they are carried on different chromosomes, may indeed be the same. As breeding experiments with sheep take a long time, this idea is announced for the information of other workers before experimental proof is available. It is considered that the breeding of N-type sheep on a larger scale would make available a supply of wool very well suited for the manufacture of carpets.—M. C.

See also absts. **577-579** (spermatozoa); **608** (the problem of fertility: a symposium).

ZOOTECHNY

ALLEN, N. N. (1946.) **Variations in the live weight of dairy cattle.**—*Bull. Vt agric. Exp. Sta.* No. 534. pp. 12. **601**

Apparatus was designed which allowed for the weighing at any time, and without disturbing them, of ten cows, whose weights (determined with an accuracy of 1 lb.) were recorded at half-hour intervals during a period of ten days. The weights of food and water consumed, and of faeces and urine voided, were also recorded.

When the variations in body weight of the individual animals were shown graphically, a striking uniformity was observed in the times at which maximum, minimum and average weights for the day were reached.

There were noteworthy individual variations in the frequency of voiding and in the amounts of faeces and urine passed, and also in frequency of drinking and quantity of water taken per drink.

Five of the cows were in lactation and were milked at times to which they had been accustomed. On the average these animals took 113% more water, consumed 30% more feed, and eliminated 55% more faeces and 35% more urine, than dry cattle; they also lost 10% more in " insensible loss ".

In view of their findings the authors suggest that in any experiments in which live weights are to be determined, careful thought should be given to the purpose in mind: they make a number of recommendations.—J. T. ABRAMS.

HAMILTON, H. M. (1948.) **The Hammond method of castrating lambs—elastration.**—*J. Amer. vet. med. Ass.* **113.** 337. **602**

Several million lambs in Australia and more than two million in New Zealand have been castrated by the method of " elastration " which has also been tried in the U.S.A.

The method consists of the application of a taut rubber band to the neck of the scrotum which, by pressure necrosis, sloughs in about 20 days. Complications such as haemorrhage, wound infection, tetanus and fly strike do not occur. The same method is used for docking.—E. J. H. FORD.

See also absts. **598** (management of bulls); **612** (compendium of the horse).

REPORTS

U.S.A. WASHINGTON. (1941.) **Report of Agricultural research and other activities of the Western Washington Experiment Station for the fiscal year ended March 31, 1941.** [KALKUS, J. W.] pp. 70. Puyallup, Washington. Items of veterinary interest pp. 42–52, 63–66. **603**

The Department of Poultry Husbandry reported that in their leucosis-resistant strains of poultry total mortality in 18–28-day periods was 47·2% in 1939 and 35·6% in 1940, and the LEUCOSIS mortality was 20·7% and 13·3% respectively, whereas in the susceptible strains total mortality ranged from 60·6–78·8% in 1939 to 66·6–79% in 1940, and leucosis mortality varied from 40·8–54·1% in 1939 to 34·3–51·5% in 1940. Mortality figures in all flocks under experiment were aggravated by the fact that severe culling methods were not practised. Any birds removed alive were very weak, emaciated, paralysed or blind and were removed only to facilitate diagnosis.

It was observed that fewer ocular cases occurred in resistant strains than in the susceptible strains. In 1941 the two resistant strains had respectively 2·9% and 9·5% with affected pupils and 7·8% and 11·2% with affected irises as compared with 15·2–21·8% affected pupils and 19·6–42·4% affected irises in the susceptible strains.

Control of CANNIBALISM by increasing the salt in poultry rations was unsuccessful.

It was found that 500 U.S.P. Units of vitamin A from carotene per 100 g. were adequate for high egg production and the maintenance of good health. Yellow carrots were a good source of vitamin and did not colour yolks too deeply.

From the Department of Veterinary Science (Hamilton, C. M.) it was reported that owing to severe reactions causing economic loss through reduced output of eggs after vaccination against FOWL POX, pigeon pox virus had been used with satisfactory results. To obtain the best results a potent pigeon pox vaccine must be used and applied by the feather follicle method; 15–20 large feathers are removed and the vaccine must be applied so as to enter the follicles.

There has been a steady decrease in PULLORUM DISEASE; 106,000 tests had yielded only 0·6% reactors. There had also been a slight decrease in incidence of the LEUCOSIS complex. Coccidiosis of the small intestine probably caused more loss than any other single disease and this loss had remained constant for three years. FOWL CHOLERA was diagnosed for the first time in turkeys during January 1941. Losses were 90% in the males and 35% in the hens. CONTAGIOUS ABORTION tests were carried out on 23,454 cattle.—J. A. G.

U.S.A. Georgia. (1946.) **Twenty-sixth annual report, 1945–1946, Georgia Coastal Plain Experiment Station. Bulletin 43.** pp. 56. Items of veterinary interest pp. 31–32. **604**

MASTITIS control was being effected by a survey of all herds including a free laboratory test of the milk of each cow; by milking mastitis-free cows in the herd first, cured cases next and infected cows last; by treating all cows found to be infected with mastitis and eliminating incurable cows as soon as possible. Treatment was by four injections of 25,000 units of penicillin in 50 ml. of sterile distilled water into each infected quarter of the udder at intervals of 12 hours, or a larger dose in distilled water or mineral oil left in the udder for 24 hours. An abscess condition in the head among hunting dogs proved to be due to an *Actinomyces* sp.

Tests of the value of bacterins in the prevention of RESPIRATORY INFECTIONS of cattle were being made and also of the new SWINE FEVER vaccines. CALCIUM AND PHOSPHORUS DEFICIENCIES had been reported in the pasture of the Coastal Plain area. The usual mineral mixture fed to cattle consisted of steamed bone meal and salt.

—J. A. GRIFFITHS.

BOOK REVIEWS

MORGAN, B. B. [B.S., M.S., Ph.D., Associate Professor of Veterinary Science, College of Agriculture, University of Wisconsin], & HAWKINS, P. A. [A.B., M.A., D.V.M., Associate Professor of Parasitology, School of Veterinary Medicine, Michigan State College, East Lansing]. (1948.) **Veterinary protozoology.** pp. vii+195. Minneapolis: Burgess Publishing Co. **605**

The preface to this book explains that it has been devoted to protozoan diseases of animals of veterinary importance in North America, as there is no text-book covering this subject, although several books exist "on the morphology and life histories of protozoan diseases of animals". Although the work of foreign authors is referred to, the bibliography is only intended to cite "the more important American references", the only exceptions being the work of Horton Smith & Taylor, and J. S. S. Steward on coccidiosis. The book describes both the pathogenic and non-pathogenic protozoan parasites of domestic animals in the United States, but only very occasional reference is made to similar parasites occurring elsewhere. Thus the only babesia mentioned are *B. bigemina* of cattle and *B. canis* of the dog, and the only trypanosomes described are *T. equiperdum* and *T. theileri*.

Whether such a restricted view of "Veterinary Protozoology" is sufficient to meet the educational needs of American veterinary students is questionable, particularly in view of American interests in the Panama canal zone and other tropical areas, though possibly extension courses are visualized to meet the needs of men posted to such areas. Even in the United States one would have supposed that the veterinary surgeon might be more valuable if he were able to recognize such parasites as *B. argentina*, *T. vivax* and *T. evansi* which occur in the Caribbean area, and may spread northwards, and other organisms such as *B. bovis* which might be introduced from Europe, apart from the added interest the subject acquires from the knowledge that such species exist.

In discussing the difficulty of eradicating *B. bigemina* in some areas, it is pointed out that deer may act as the reservoir host of ticks, but no reference is made to Brumpt's discovery that piroplasms may survive in ticks fed on non-susceptible hosts for several generations. The only references given in regard to the development cycle of babesia in ticks are those to the works of Dennis (1932) and Christophers (1907), and a process of syngamy in the tick is accepted although recent workers have been unable to confirm its occurrence. It is also interesting to note the

atypical symptoms shown in *B. canis* infection of dogs in the United States, as they suggest an infection more nearly resembling that of *B. gibsoni*.

The various protozoa are described in chapters devoted to the parasites of the host which they infect, horses, cattle, sheep and goats, swine, dogs and cats, poultry and fur-bearing animals, a further chapter being devoted to the diagnosis of infections, and appendices to a parasite-host list and treatment schedules. This arrangement obscures the relationship of the parasites of one host to those of another, and necessitates a certain amount of reduplication of information, or in some cases a reference to another chapter. The notes on diagnosis, given under the descriptions of the infections, do not always connect up well with the chapter on diagnosis, and sometimes such notes are omitted altogether.

In spite of its restriction to conditions in the United States of America, the book has a considerable value as it gives a complete picture of the findings of American workers on subjects such as the protozoan parasites of poultry, and emphasizes the practical importance of their findings in a way which would be impossible for anyone not closely associated with the work concerned.

The book is thoroughly up to date, a remarkable achievement in view of the scattered literature which has to be studied, and the authors appear to have also largely avoided the danger of accepting recent research findings as facts before they have been confirmed or have stood the test of application in practice.

A note at the end of the appendix gives a list of periodicals in which articles of importance on protozoa of animals may appear, and although not complete, this might be very useful to those wishing to keep up to date on the subject.—U. F. R.

DUKES, H. H. [D.V.M., M.S., Professor of Veterinary Physiology, New York State Veterinary College, Cornell University]. (1947.) **The physiology of domestic animals.** pp. xii + 817. 184 figs. Numerous refs. Ithaca, New York: Comstock Publishing Company, Inc. 6th Edit. **606**

The author has made a great effort to gather together into one book all the reliable comparative data on the physiology of the farm animals and for that reason alone he has rendered good service to all those who work with domestic animals. There is a difference, however, between collecting data and weaving the facts at one's disposal into a comprehensive thesis. It is well known that there are important differences between the various domestic animals in their physiological make-up, but far less is generally known of the probable reasons for, or the implications of, these differences. This is the gap which a book of this calibre should do its best to fill and it is disappointing to find that in some places the author is content to state the facts with little attempt to discuss their implications. Where the facts are few this is the wisest policy to adopt, but too much caution in this respect is to be deprecated.

The sixth edition of this book has grown by about a hundred pages. The sections dealing with the blood, the male generative organs, ruminant digestion, and carbohydrate metabolism have been considerably expanded. A welcome addition is a new chapter dealing with the important subject of growth, based largely on the work of Hammond and his school at Cambridge. It is to be hoped that in future editions this chapter will be further expanded and that, in addition, greater attention will be given to pre-natal growth. The fact that six editions of this book have been published since 1933 is proof of the demand for physiological information on the domestic animals and that the author is anxious to keep his book up to date. In the past the task of writing a physiology of the large domestic animals was well-nigh impossible for, except for scattered information available on the digestive tract and on reproduction, most of the information had to be gathered from work done on small laboratory animals. To-day far more data on large animals are available and it is possible to look into the future and to predict that the difficulty will become one of presenting the available information without breaking up the context, rather than looking for material to include. No one has more experience of this than the author and it is to be hoped that he will continue his work and will publish further editions.—A. T. P.

CORRIE, F. E. [B.Sc., N.D.A., N.D.D.]. (1948.) **Some elements of plants and animals.** pp. x + 120. 226 refs. London: Fertiliser Journal, Ltd. 8s. 6d. [Reprinted from *Fertiliser & Feeding Stuffs Journal*, 1945–47.] **607**

This book is a compendium of a series of articles written for a trade journal with the minimum of alterations and reshaping of the original text. It makes no attempt to be either an exhaustive or critical survey of the literature of mineral elements in plant and animal nutrition, but is essentially a compilation of analytical data and quotations from original or review articles, with the specific purpose of providing manufacturers of fertilizers and feeding stuffs with some of the basic principles of the broad subject of "minerals". In consequence, much of the fundamental information which the more scientific reader finds so valuable in review articles has been omitted or lightly glossed over, although it must be realized

that the original articles making up this book could not have served their purpose had they been written on the plane normally expected of reviews. Nevertheless, the author has assembled from a very wide range of references a vast amount of figures and data that may not be readily accessible to all readers, and he has certainly provided in handy and convenient form a most useful array of facts and some valuable references from which more detailed information may be obtained by those particularly interested in this field.

After a short introduction consideration is given to the importance in both plant and animal nutrition of the elements Ca, P, K, Mg, S, Na, Cl, Fe, I, Cu, Mn, Co and B, with a concluding chapter on other elements such as Zn, Mo, F, Si, Se and Ni.

The book should serve as a handy little reference work for a much wider range of readers than those for whom the original articles were written and, provided its more limited usefulness for the purely scientific reader is borne in mind, it should find a place on the library shelves of those whose interests are primarily in the direction of plant and animal nutrition.—A. EDEN.

Edited by ENGLE, E. T. (1946.) **The problem of fertility. Proceedings of the Conference of Fertility held under the auspices of the National Committee on Maternal Health.** pp. viii+254. Princeton, New Jersey: Princeton University Press. $3.75. **608**

This book is made up of the papers read at a conference on fertility organized by the United States National Committee on maternal health, in order to reveal the successes of investigations on reproductive processes in domestic animals. The papers are short, and are useful chiefly as digests or summaries of recent work published in research journals, since they contain very little that is quite new. Four of the 16 papers relate to work purely in the human field, two are of general application and the remainder apply specifically to various kinds of domestic animals.

The papers have been classified into order, according to subject matter, but no attempt has been made to draw conclusions from the data where papers deal with a given problem from different angles; or otherwise by fresh writing to integrate the results of research by many different workers. But the concise nature of the papers, and in some cases rather elementary, occasionally anecdotal, treatment of their subjects, makes it a pleasant intellectual exercise for the specialist reader to attempt such correlation for himself. The same features, aided by the caustically amusing nature of some of the discussions, render the book a very suitable, while still comprehensive, introduction to the subject for the veterinarian who is not familiar with the original articles in which these investigations were first described.

The reviewer considers that the most interesting and remarkable feature of the book is the ready recognition by the American medical profession that inspiration for further research in the field of human medicine is to be drawn from the notable progress made in the veterinary field. This is not only clearly stated in a preface by the medical clinician who acted as editor, but is evinced by the fact that most of the conference members who assembled to hear these papers, chiefly on veterinary subjects, were specialists in the corresponding branches of human physiology and pathology.

The titles of the papers are as follows:– Patterns of oestrous cycles; Ovulation and oestrus in sheep and goats; Induction of ovulation and subsequent fertility in domestic animals; The induction of ovulation in domestic animals; The ovary at the time of ovulation; Hormonal control of ovulation; Cervical mucus and the menstrual cycle; Spermatozoa and cervical mucus; Glycolysis, livability, and fertility of bovine spermatozoa; Metabolism and motility of human spermatozoa; Fertilizing capacity of rabbit spermatozoa; Biology of equine spermatozoa; Artificial insemination of dairy cattle; The cervix uteri in sterile matings; The effect of synthetic thyroprotein on sterility in bulls; Methods for determining the time of ovulation in domestic animals.

—F. L. M. DAWSON.

MACKIE, T. J. [M.D., D.P.H., Professor of Bacteriology, University of Edinburgh], & MCCARTNEY, J. E. [M.D., D.Sc., Director of Research & Pathological Services, London County Council]. (1948.) **Handbook of practical bacteriology. A guide to bacteriological laboratory work.** pp. vi+624. Edinburgh: E. & S. Livingstone. 8th Edit. 25s. **609**

In this edition of this well-known book the size of the pages has been increased and their number reduced. The new style is a great improvement on the old. The plan is the same as that of earlier editions; but material given as an appendix in the last edition has now been incorporated in the general text.

In a work of this type, covering so wide a subject, it is easy for the individual worker to think of additional methods that he considers worthy of inclusion. It is far from easy, however, to suggest what should be omitted to provide the necessary space. The authors have performed the difficult task of selection well and "Mackie and McCartney" will continue to be an important item of equipment for the bacteriological laboratory.—J. RICHARD HUDSON.

BEACH, F. A. [Professor of Psychology, Yale

University]. (1948.) **Hormones and behaviour. A survey of interrelationships between endocrine secretions and patterns of overt response.** pp. xiv+368. New York: Paul B. Hoeber, Inc. Bibliography, glossary and index. **610**

In the preface the author divides books into two types. The first type, he says, grows like a living organism, starting with a central idea and proceeding along a course of differentiation and individuation so that the final result represents a well organized whole. In contrast, the second type merely supplies a body of facts and references and is not a living organism. With rare modesty he puts his own book in the second category. In actual fact, however, it is a good deal more than that, since he has not only undertaken to collect data concerning hormones and behaviour but his presentation also represents an analysis of the relation between sexual and other types of behaviour, *e.g.*, migration, individual aggressiveness and processes of learning. The fact that he is not a "professional endocrinologist" does not prevent him from showing discrimination and scepticism. In his discussion of psycho-endocrinological relationships in man, for example, he says that a great deal of objective quantitative and critical evidence will be needed before the data which he quotes are accorded serious consideration by the majority of scientists. The book, which contains quite a good bibliography, should prove of value to all those interested in the action of hormones and the factors controlling behaviour.

—J. M. Robson.

Franklin, K. J. [D.M., F.R.C.P., Professor of Physiology at the Medical College of St. Bartholomew's Hospital]. (1948.) **Cardiovascular studies.** pp. xvi+306. Oxford: Blackwell Scientific Publications. 42s. **611**

A considerable part of the author's previous work on the circulatory system has been directed to study of structures responsible for streamlining the flow through the heart and vessels, and this book is concerned with the arrangement of two such cardiac structures, the valve of Eustachius and the tubercle of Lower. The evidence is presented in three categories, historical, experimental and morphological.

It is fitting, when discussing the discoveries of two eminent scientists of the past, that the story should begin with a historical survey and Franklin weaves into a pattern, in a most fascinating historical review, everything of importance that has been written on these two structures.

A method unavailable to earlier workers, cineradiographic tracings of the blood flow during life, forms the basis of the experimental findings and these, added to other evidence, enable Franklin to introduce a new concept: that the presence, height and condition of the Eustachian valve can be correlated with the direction of flow of the anterior/superior caval blood stream. The size of the tubercle of Lower can be related to the presence of the Eustachian valve in that, if the latter structure is present, the tubercle is usually poorly developed, and it is also true that the size, position and shape of the tubercle will influence the direction of flow of the anterior/superior caval stream. The evidence presented herewith from the dissection of a vast number of mammalian hearts lends support to this concept, but it is perhaps a pity that Franklin does not discuss more fully other factors which might influence the arrangement of the tubercle, *e.g.*, the position of entry into the heart of the main azygos drainage.

The author states in his preface that descriptions of individual hearts must lack much of the interest of a straightforward, continuous narrative, but he need have no fears on the acceptance of this part of the book. Indeed, in many ways the detailed description of heart and lungs representing every mammalian order is the most valuable part, providing as it does unparalleled information for the benefit of future workers who, incidentally, might gain much from Franklin's method and technique.

The work is well illustrated and contains an excellent bibliography. It can be highly recommended to all interested in that most vital problem, the circulation of blood. The publishers have maintained the high standard that one now associates with their recent series of scientific publications.—C. W. Ottaway.

Langeler, G. [Lecturer at the State Agricultural Winter School in Zutphen]. (1945.) Mozaiek Van Het Paard. **(Compendium of the horse.]** pp. 170. Lochem: De Tijdstroom. F.3.50. **612**

In this book the author, who is a veterinarian, has collected hundreds of sayings about horses, from the Bible and other religious books, plays, proverbs, prose and verse. There is also an interesting chapter on terms used in hippology and farriery. It is of course written throughout in Dutch.

The book is a good one to dip into in moments of leisure and in some parts will serve as a useful reference book.—J. E.

See also absts. **574** (actions of radiations on living cells); **566** (pharmaco-therapeutic notebook).

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